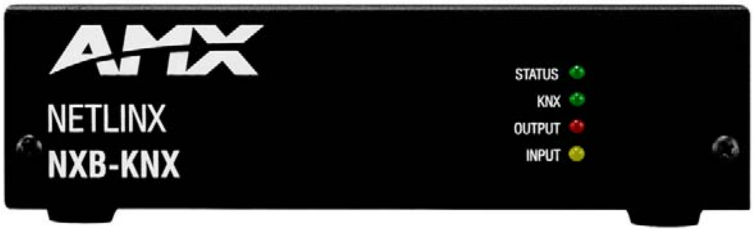
Instruction Manual

NXB-KNX

KNX Communications Gateway



NetLinx Interface Controllers

Last Revised: 4/28/2014

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NXB-KNX KNX Communications Gateway

Overview

The NXB-KNX KNX Communications Gateway (FG2031-01) allows AMX NetLinx Integrated Controllers the ability to control, integrate and communicate with homes and buildings that utilize the KNX communication protocol.

KNX is the world's first open, royalty-free, and platform independent standard for home and commercial building control.

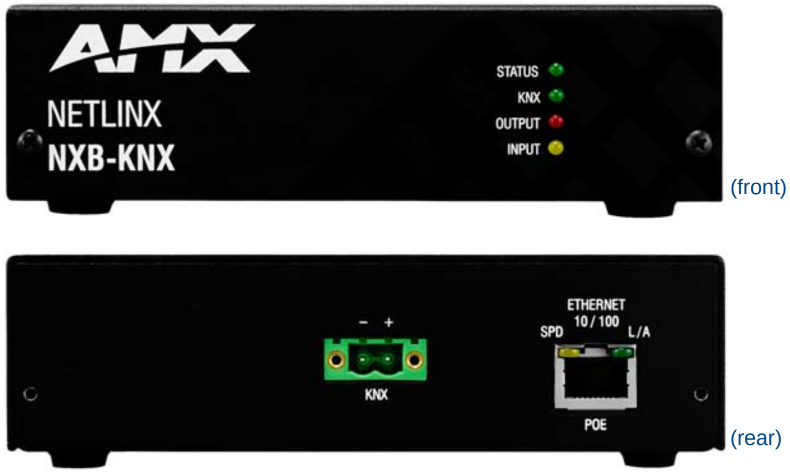


FIG. 1 NXB-KNX Interface

Product Specifications

NXB-KNX Specifications	
Front Panel LEDs	• Status (green): Blinks to indicate that the unit is communicating with the NetLinx Master. Any state other than blinking indicates the unit has not completed boot up. • KNX (green): Solid on indicates power is on and the unit is connected to the KNX bus. • Output (red): Lights to indicate traffic from the NXB-KNX to the KNX bus. • Input (yellow): Lights to indicate traffic from the KNX bus to the NXB-KNX.
Rear Panel Connectors:	• KNX 2-pin captive-wire connector (optically isolated). • Ethernet Port - 10/100 Ethernet with PoE. LEDs show communication activity, connection status, speeds, and mode information: SPD (speed) - Yellow LED lights On when the connection speed is 100 Mbps and turns Off when the speed is 10 Mbps. L/A (link/activity) - Green LED lights On when the Ethernet cables are connected and terminated correctly, and blinks when receiving Ethernet data packets.
Power Requirements:	• PoE powered – no local Power Supply needed • IEEE 802.3af Compliant
Memory:	• 64 Mbytes of RAM • 256 Mbytes of FLASH
Dimensions (HWD):	With feet: • 1.66" x 5.54" x 4.10" • 4.216 cm x 14.07 cm x 10.42 cm Without feet: • 1.52" x 5.54" x 4.10" • 3.861 cm x 14.07 cm x 10.42 cm
Weight:	1.45 lbs. (0.65 kg)

NXB-KNX Specifications (Cont.)	
Operating Environment:	• Operating Temperature: 32°F - 104°F (0°C - 40°C) • Relative Humidity: 5% to 85% non-condensing • Intended for indoor use only
Included Accessories:	• Rubber feet • Green 2-Pin 5mm Phoenix connector with captive screws
Other AMX Equipment:	• AC-DIN-CS3 DIN Rail Mounting Bracket (FG532-01) • PS-POE-AF PoE Injector (FG423-80)
Certifications:	• FCC Class B • CE • IEC60950 • RoHS

Installation

Wiring and Connections

NOTE

To avoid any damage to the electronic component, installation must be performed in an ESD safe environment.

NOTE

Do not connect power to the NXB-KNX until the wiring is complete.

The NXB-KNX is installed between the NetLinx Master and the KNX control bus, and passes NetLinx control commands to the KNX control bus via 2-wire twisted pair cabling, as indicated in FIG. 2:

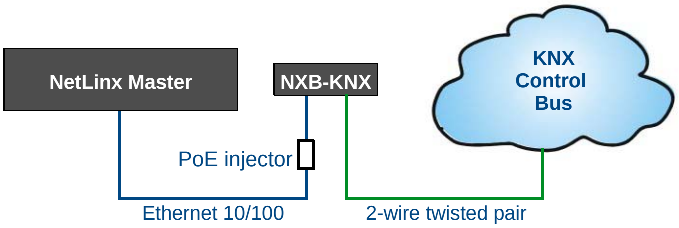


FIG. 2 NXB-KNX installation

After you have completed the installation, consult the *Configuration* section on page 5.

Ethernet 10/100 Base-T RJ-45 Wiring Configuration

The table below describes the pinouts, signals, and pairing for the Ethernet 10/100 Base-T connector and cable.

Ethernet Pinouts and Signals				
Pin	Signals	Connections	Pairing	Color
1	TX +	1 --------- 1	1 --------- 2	White-Orange
2	TX -	2 --------- 2		Orange
3	RX +	3 --------- 3	3 --------- 6	White-Green
4	no connection	4 --------- 4		Blue
5	no connection	5 --------- 5		White-Blue
6	RX -	6 --------- 6		Green
7	no connection	7 --------- 7		White-Brown
8	no connection	8 --------- 8		Brown

FIG. 3 diagrams the RJ-45 pinouts and signals for the Ethernet RJ-45 connector and cable.

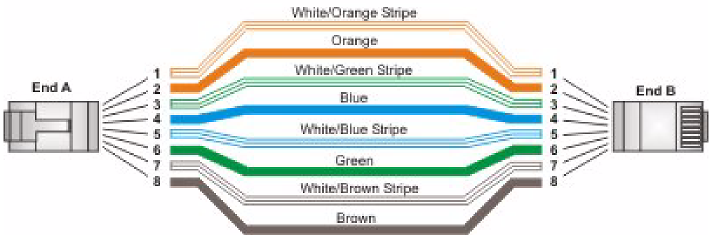


FIG. 3 Straight-Through Wiring

PoE (Power Over Ethernet)

The NXB-KNX uses CAT5/CAT6 wire via the Ethernet port for PoE power.

Use the PS-POE-AF Power over Ethernet Injector (FG423-80) to simplify wiring and installation by eliminating the need for an AC outlet at each point of installation.

NOTE

The NXB-KNX can be placed up to approximately 330’ (100 meters) from PoE Injector.

- If used with a non PoE-capable Ethernet switch (such as the NXA-ENET24), then an optional PS-POE-AF Power-over-Ethernet (PoE) power supply is required to provide power to the NXB-KNX.
- If the NXB-KNX is used with a PoE-capable Ethernet switch (such as the NXA-ENET24PoE), then no PoE Injectors are required.

KNX Connector

The KNX connector on the rear panel is a 2-pin captive-wire connector (optically isolated) that provides communication between the NXB-KNX and the KNX control system via 2-wire shielded twisted pair cabling (FIG. 4).

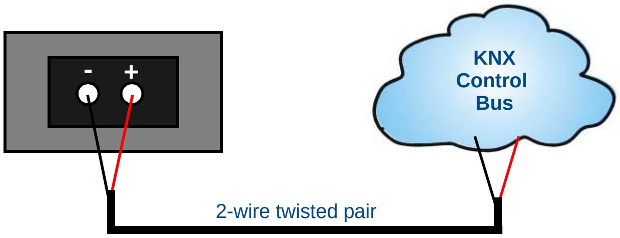
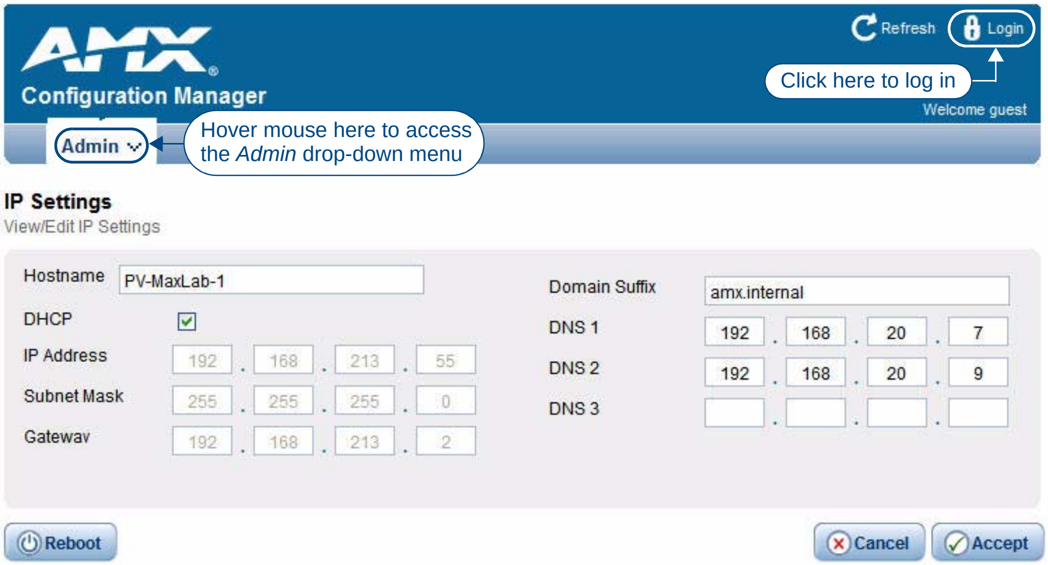


FIG. 4 KNX Connector wiring diagram

Configuration

Overview

NXB-KNX units have a built-in WebConsole that allows you to make various configuration settings via a web browser on any PC that has access to the NXB-KNX device. The web console consists of a series of web pages that are collectively called the "NXB-KNX Configuration Manager" (FIG. 5).



Click here to log in

Hover mouse here to access the *Admin* drop-down menu

IP Settings
View/Edit IP Settings

Hostname: PV-MaxLab-1
DHCP: ☑
IP Address: 192 . 168 . 213 . 55
Subnet Mask: 255 . 255 . 255 . 0
Gatewav: 192 . 168 . 213 . 2

Domain Suffix: amx.internal
DNS 1: 192 . 168 . 20 . 7
DNS 2: 192 . 168 . 20 . 9
DNS 3: . . .

FIG. 5 NXB-KNX Configuration Manager - IP Settings Page (initial view)

The NXB-KNX is set to **DHCP** by default.

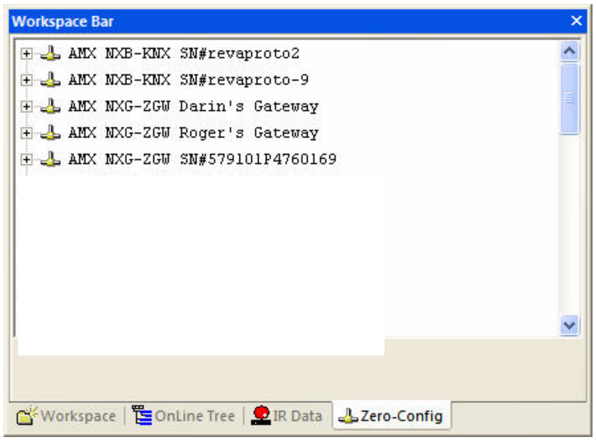
Determining the IP Address of the NXB-KNX

NXB-KNX units feature a built-in zero-configuration networking client that allows you to determine the unit's IP address via NetLinx Studio v3.0 (or higher), or a similar zero-configuration client.

Zero-configuration (or *Zero-Config*) technology provides a general method to discover services on a local area network. In essence, it allows you to set up a network without any configuration, as described below.

NetLinx Studio (featuring Zero-Config functionality)

NetLinx Studio (v3.0 or higher) features a "Zero-Config" tab in the Workspace Window. This tab provides Zero-Config networking functionality within NetLinx Studio (FIG. 6).



```
AMX NXB-KNX SN#revaproto2
AMX NXB-KNX SN#revaproto-9
AMX NXG-ZGW Darin's Gateway
AMX NXG-ZGW Roger's Gateway
AMX NXG-ZGW SN#579101P4760169
```

FIG. 6 Workspace Bar - Zero-Config tab

Refer to the NetLinx Studio online help for details on using Zero-Config.

Accessing the NXB-KNX WebConsole via Zero-Config

Assuming that the NXB-KNX resides on the same LAN as the PC running NetLinx Studio, and the NetLinx Master to which the NXB-KNX is connected, you can access the NXB-KNX via the Zero-Config feature in Netlinx Studio, as described below:

1. In NetLinx Studio (version 3.0 or higher), right-click inside the *Zero-Config* tab of the Workspace Bar to access the Zero-Config context menu (FIG. 7).

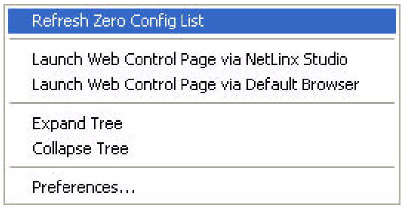
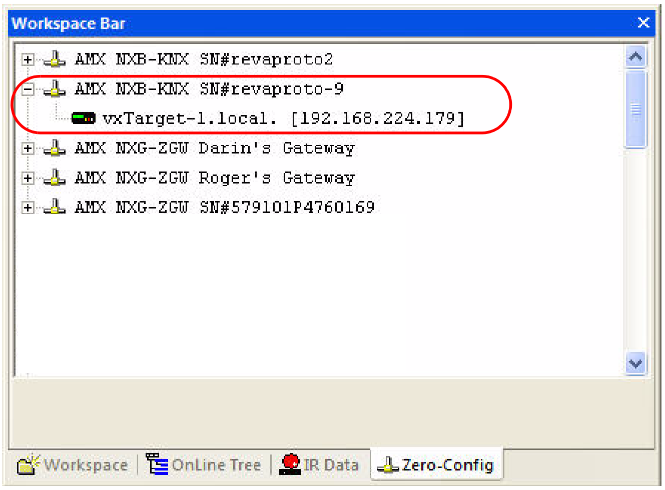

Refresh Zero Config List
Launch Web Control Page via NetLinx Studio
Launch Web Control Page via Default Browser
Expand Tree
Collapse Tree
Preferences...

FIG. 7 NetLinx Studio - Zero-Config context menu

2. Select **Refresh List** to generate an initial listing of all Zero-Config devices detected (FIG. 8).
3. Click the plus symbol (+) to expand any device in the Zero-Config list. The device's current IP Address is listed below the device name (FIG. 8):



```
AMX NXB-KNX SN#revaproto2
AMX NXB-KNX SN#revaproto-9
    vxTarget-1.local. [192.168.224.179]
AMX NXG-ZGW Darin's Gateway
AMX NXG-ZGW Roger's Gateway
AMX NXG-ZGW SN#579101P4760169
```

FIG. 8 Workspace Bar - Zero-Config tab

4. You can access any device in the Zero-Config list simply by double-clicking on it's entry. The selected device's WebConsole (HTML) is displayed in a NetLinx Studio window.
5. The unit's IP Address can be edited **IP Settings** page (see the *IP Settings* on page 10).

Accessing the WebConsole via Web Browser

From any PC that has access to the LAN that the NXB-KNX resides on:

1. Open a web browser and type the IP Address of the target NXB-KNX unit in the Address Bar.
2. Press Enter to access the WebConsole for the specified NXB-KNX unit. The initial view is the *IP Settings* page (FIG. 5).

Admin Menu

There are several configuration pages included in the Configuration Manager, all of which are accessed via the *Admin* drop-down menu (FIG. 9):

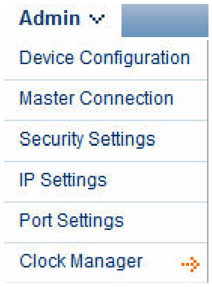


FIG. 9 NXB-KNX Configuration Manager -Admin menu

Click on an option in this menu to access each of the configuration pages, as described in the following sub-sections:

NOTE

If you see the additional entries: ***Application Upgrade*** *and* ***Firmware Upgrade*** *in the Admin menu, it is an indication that your NXB-KNX is currently using an older version of the device Application and Firmware.*

Refer to the One-Time Upgrade of the NXB-KNX to a Native NetLinx Device on page 45 *for instructions on upgrading your NXB-KNX to the latest NetLinx Firmware.*

Once the unit has been upgraded to the current version of NetLinx Firmware, the Admin Menu will appear as it is shown in FIG. 9.

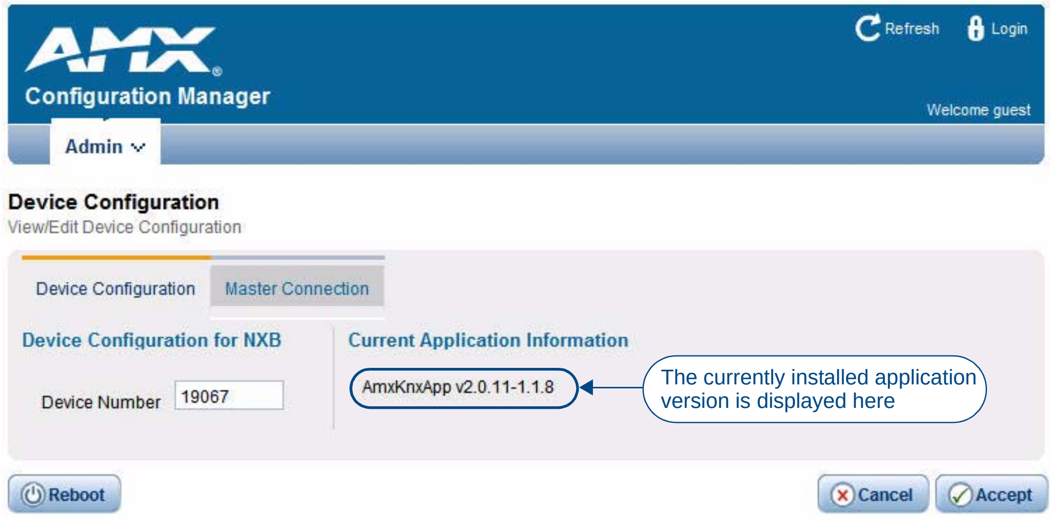
Device Configuration

Select **Device Configuration** from the Admin menu to open the *Device Configuration* page. Use the options on the page to specify a Device Number and define connection information for the NetLinx Master.

This page contains two tabs: **Device Configuration**, and **Master Connection**.

Device Configuration tab

The initial view of this page is the *Device Configuration* tab (FIG. 10):



Device Number 19067

AmxKnxApp v2.0.11-1.1.8

The currently installed application version is displayed here

FIG. 10 Device Configuration page - Device Configuration tab

The current device number assigned to this NXB-KNX unit is displayed in the *Device Number* field.

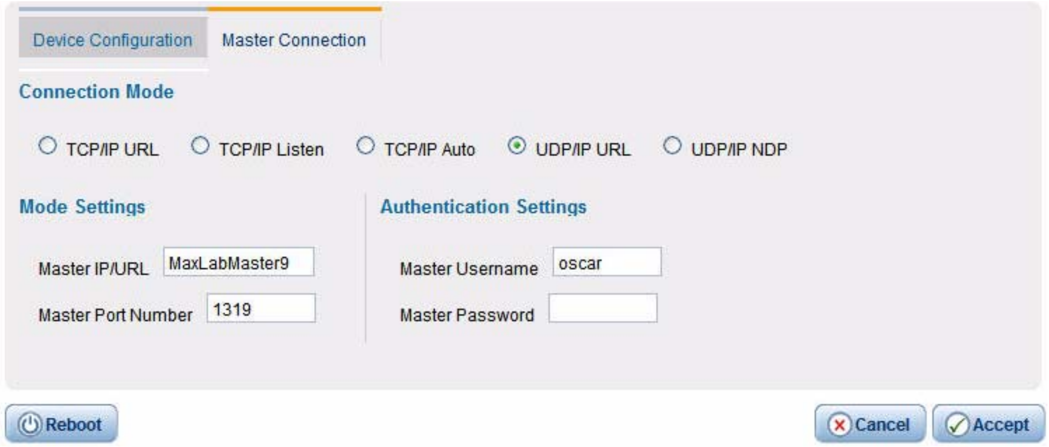
The version of the device Application currently loaded on this unit is displayed under *Current Application Information*.

Changing the Device Number

1. Enter a Device Number for this NXB-KNX unit in the **Device Number** text field.
2. Click **Accept** to save your changes.
3. Press **Reboot** to reboot the NXB-KNX and apply the new Device Number assignment.

Master Connection tab

The options in the *Master Connection* tab allow you to view and edit connection details for the NetLinx Master to which this NXB-KNX unit will be connected (FIG. 11). Note that the *Master Connection* options can also be accessed directly from the Admin Menu (select **Master Connection**).



Connection Mode

○ TCP/IP URL ○ TCP/IP Listen ○ TCP/IP Auto ● UDP/IP URL ○ UDP/IP NDP

Mode Settings

Master IP/URL: MaxLabMaster9

Master Port Number: 1319

Authentication Settings

Master Username: oscar

Master Password:

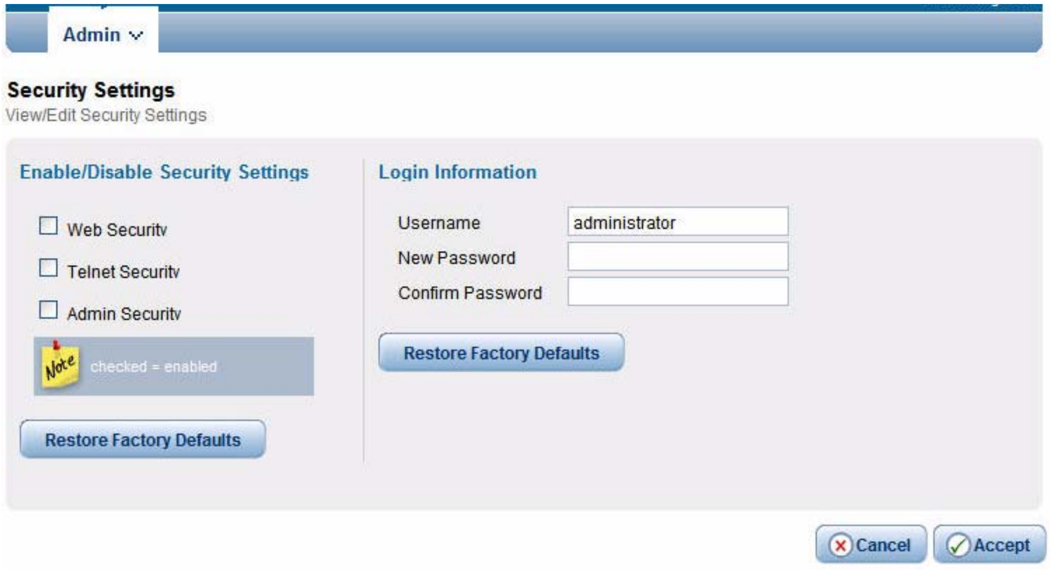
FIG. 11 Device Configuration page - Master Connection tab

To establish communication between the NXB-KNX and a specific NetLinx Master:

1. Enter the Master's IP/URL in the *Master IP/URL* text field.
2. The default *Master Port Number* assignment is **1319** - do not change this number.
3. Under *Authentication Settings*, enter the NetLinx Master's *Username* and *Password* (only required if the target NetLinx Master has Authentication enabled).
4. Press **Accept** to save changes.
5. Press **Reboot** to reboot the NXB-KNX. Once rebooted, the NXB-KNX should be in communication with the Specified NetLinx Master (indicated by a steady blink on the NXB-KNX Status LED).

Security Settings

Select **Security Settings** from the Admin menu to open the *Security Settings* page (FIG. 12). Use the options on the page to specify security options and login information for this NXB-KNX unit.



Security Settings
View/Edit Security Settings

Enable/Disable Security Settings

□ Web Securitv
□ Telnet Securitv
□ Admin Securitv

checked = enabled

Login Information

Username: administrator
New Password:
Confirm Password:

FIG. 12 Security Settings page

Enable / Disable Security Settings

Web Security: Click this checkbox to enable Web Security.

When Web security is enabled, a username and password are required to access any system Web pages.

Default = *disabled*

Telnet Security: Click this checkbox to enable Telnet Security.

With Telnet Security enabled, a username and password are required to establish a Telnet or SSH connection.

Default = *disabled*

Admin Security: Click this checkbox to enable Admin Security.

With Admin Security enabled, a username and password are required to modify any system configuration item.

Default = *disabled*

Restore Factory Defaults: Click to restore all security settings to their factory defaults.

Default = *all disabled*

Login Information

Use this set of options to specify a Username and Password. These will be required only if one or more of the Security Settings are enabled.

Username: Enter the Username that will be required to login to this unit if security is enabled. The default Username is "administrator".

New Password: Enter a new password that will be required to login to this unit if security is enabled. The default Password is "password".

Confirm Password: Re-enter the new password in this field.

Restore Factory Defaults: Click to restore the login information to the factory defaults:

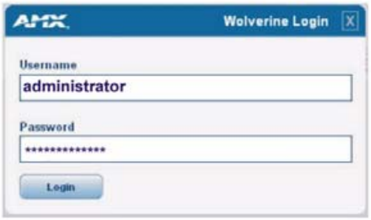
- Default Username = **administrator**
- Default Password = **password**

- Click **Accept** to save your changes. Note that changes on this page take effect immediately.
- Click **Cancel** to cancel any changes.

Logging Into the Configuration Manager (With Security Enabled)

Login is only required if the *Web* and/or *Admin* security options have been enabled on the unit.

1. Click the **Login** link in the upper-right corner of the initial page (FIG. 5). This invokes the Login popup page (FIG. 13).



Username: administrator

Password: **************

FIG. 13 NXB-KNX Configuration Manager - Login popup page

Enter the default login information:

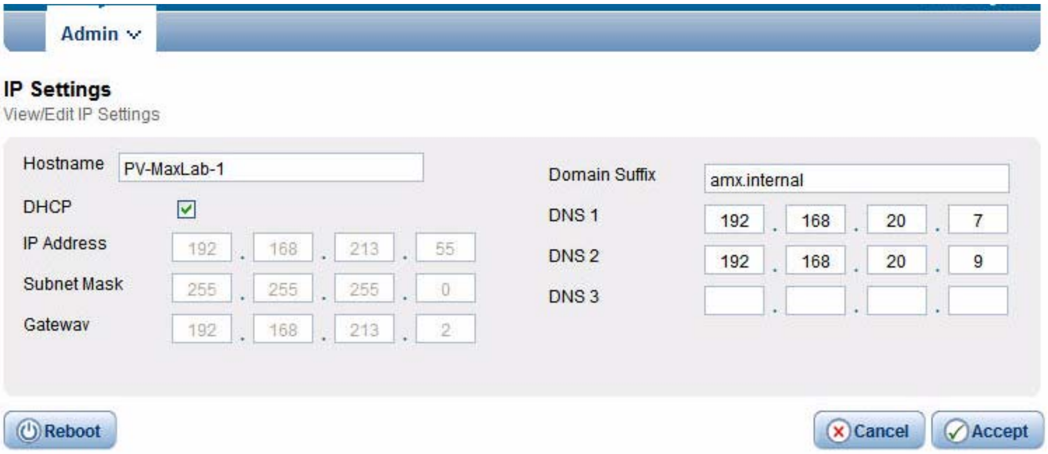
- Username = **administrator**
- Password = **password**

2. Click the **Login** button.

Once you have successfully logged into the Configuration Manager, the IP Settings page is displayed, and can be edited as needed.

IP Settings

Select **IP Settings** from the Admin drop-down menu to open the *IP Settings* page (FIG. 14). Use the options on the page to specify network/IP settings for this NXB-KNX unit.



IP Settings

View/Edit IP Settings

Hostname	PV-MaxLab-1
DHCP	☑
IP Address	192 . 168 . 213 . 55
Subnet Mask	255 . 255 . 255 . 0
Gatewav	192 . 168 . 213 . 2
Domain Suffix	amx.internal
DNS 1	192 . 168 . 20 . 7
DNS 2	192 . 168 . 20 . 9
DNS 3	. . .

FIG. 14 IP Settings page

Hostname: Enter a Hostname for this unit (enabled only if DHCP is disabled).

DHCP: Click to toggle DHCP on this unit (default = enabled).
Note that DHCP must be enabled in order for the zero-configuration client (i.e. Bonjour for Windows) to detect the NXB-KNX on the network.
See the *NetLinx Studio (featuring Zero-Config functionality)* section on page 5 for details.

IP Address: Enter an IP Address for this unit (enabled only if DHCP is disabled).

Subnet Mask: Enter a Subnet Mask for this unit (enabled only if DHCP is disabled).

Gateway: Enter a Gateway for this unit (enabled only if DHCP is disabled).

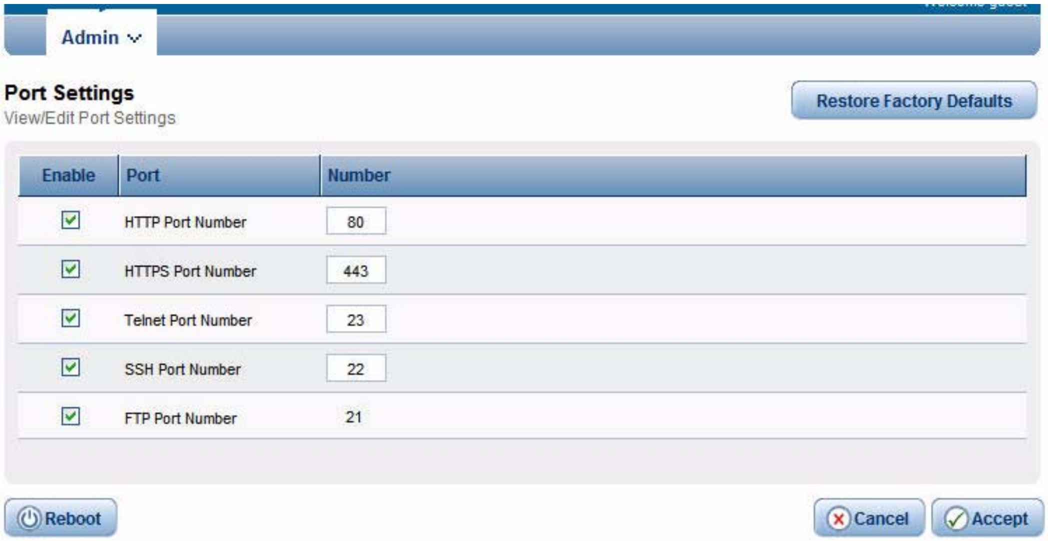
Domain Suffix: Enter the Domain Suffix for this unit.

DNS 1, 2, 3: Enter up to three DNS addresses for this unit.

Reboot: Click to initiate a system reboot.
IP Settings changes only take effect after a reboot.

Port Settings

Select **Port Settings** from the Admin drop-down menu to open the *Port Settings* page (FIG. 15). Use the options on the page to specify various Port settings for this NXB-KNX unit.



Port Settings
View/Edit Port Settings

Enable	Port	Number
☑	HTTP Port Number	80
☑	HTTPS Port Number	443
☑	Telnet Port Number	23
☑	SSH Port Number	22
☑	FTP Port Number	21

FIG. 15 Port Settings page

The options on this page provide inputs for enabling and disabling of HTTP, HTTPS, Telnet, SSH and FTP ports, and allow you to change each port number from its standard default assignment.

Restore Factory Defaults: Click to restore all Port settings to the factory defaults.

HTTP Port Number:
- Default = enabled
- Default port number = **80**

HTTPS Port Number:
- Default = enabled
- Default port number = **443**

Telnet Port Number:
- Default = enabled
- Default port number = **23**

SSH Port Number:
- Default = enabled
- Default port number = **22**

FTP Port Number:
- Default = enabled
- Default port number = **21**

Reboot:
- Click to initiate a system reboot.
- Port changes only take effect after a reboot.

Clock Manager

Hover the cursor over the **Clock Manager** option in the Admin menu to open the Clock Manager sub-menu (FIG. 16).

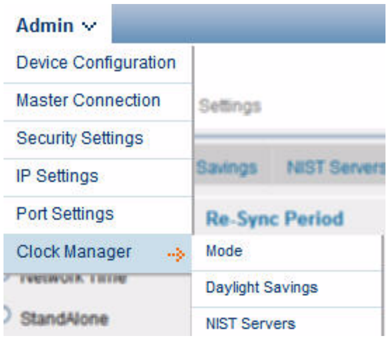


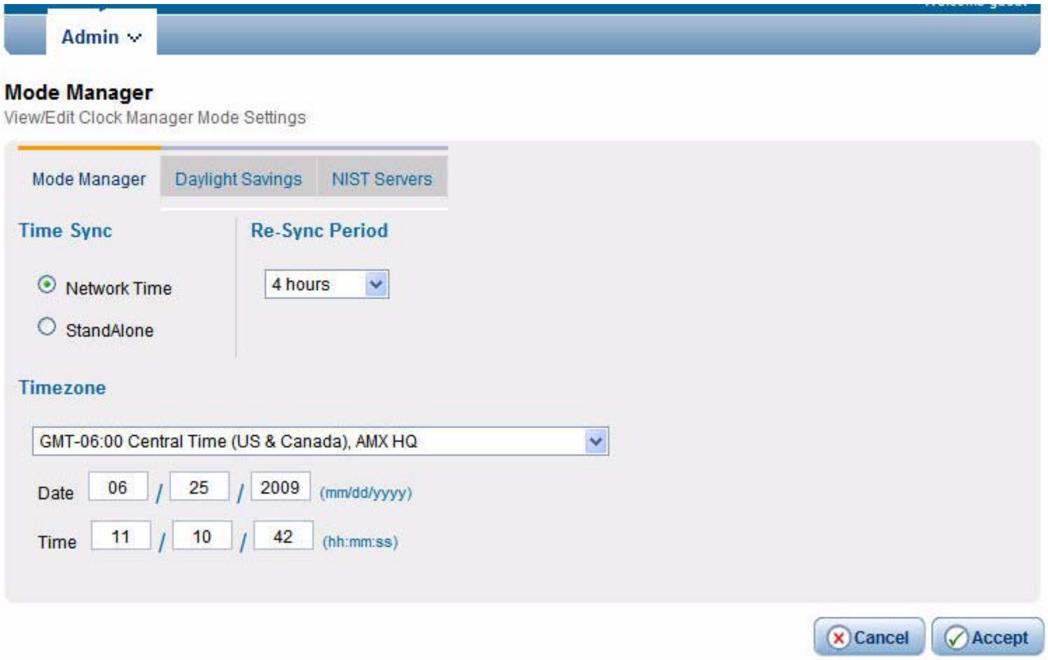
FIG. 16 Clock Manager sub-menu

Each of the options listed in the sub-menu are also accessible via options on the Clock Manager page (FIG. 17).

FIG. 17 Clock Manager options

Clock Manager - Mode Manager

Select the main Clock Manager entry in the Admin Menu, or select **Mode** from the Clock Manager sub-menu, and the *Mode Manager* page will be displayed (FIG. 18):



Mode Manager

View/Edit Clock Manager Mode Settings

Time Sync

● Network Time

○ StandAlone

Re-Sync Period

4 hours

Timezone

GMT-06:00 Central Time (US & Canada), AMX HQ

Date 06 / 25 / 2009 (mm/dd/yyyy)

Time 11 / 10 / 42 (hh:mm:ss)

FIG. 18 Clock Manager - Mode Manager page

The options on the Mode Manager page provide inputs for selecting the current mode of the system time:

Time Sync: Use the radio buttons to select either *Network Time* or *StandAlone*.

***Note**: If using StandAlone mode, the time will be valid only until the unit is rebooted. Once the unit is rebooted, the time will be lost, and will have to be reset.*

Note that the *Daylight Savings* and *NIST Servers* tabs are enabled only if *Network Time* is selected as the mode.

Re Sync Period: Select the desired re-sync period for the clock from this drop-down menu.

Re-sync period options include 5 minutes, 15 minutes, 1, 2 and 4 hours (default = 1 hour).

Timezone: Select the appropriate Time Zone from the drop-down menu.

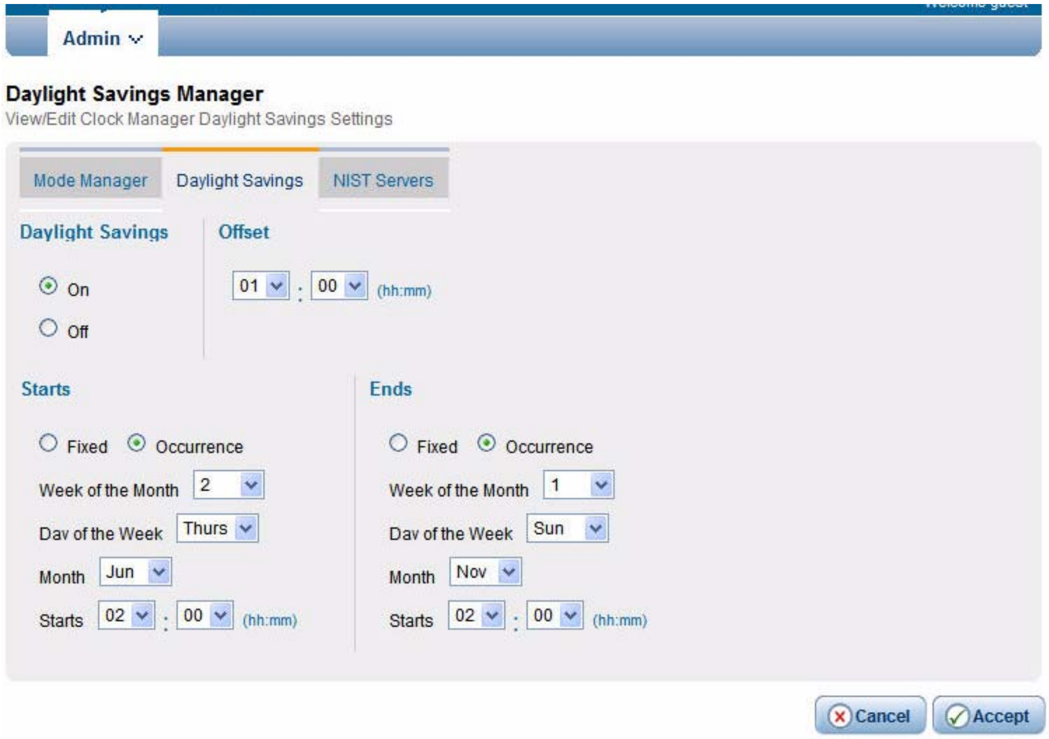
Date: Use these fields to manually enter today’s date (mm/dd/yyyy).

Time: Manually enter the current time (hh:mm:ss).

- Click **Accept** to save your changes. Note that changes on this page take effect immediately.
- Click **Cancel** to cancel any changes.

Clock Manager - Daylight Savings

Select **Daylight Savings** from the Clock Manager sub-menu (or from the main Clock Manager page), and the *Daylight Savings Manager* page will be displayed (FIG. 19):



Daylight Savings Manager

View/Edit Clock Manager Daylight Savings Settings

Daylight Savings: ● On ○ Off

Offset: 01 : 00 (hh:mm)

Starts: ○ Fixed ● Occurrence

Week of the Month: 2

Day of the Week: Thurs

Month: Jun

Starts: 02 : 00 (hh:mm)

Ends: ○ Fixed ● Occurrence

Week of the Month: 1

Day of the Week: Sun

Month: Nov

Starts: 02 : 00 (hh:mm)

FIG. 19 Clock Manager - Daylight Savings Manager page

Note that this tab is enabled only if *Network Time* is selected (on the Mode Manager page).

The options on this page allow you to enable and disable daylight savings, and specify daylight savings start and end times.

Daylight Savings: Use these radio buttons to turn daylight savings time on and off (default = Off).

Offset: Use these drop-down menus to specify the amount of time to offset the clock for daylight savings.

Starts: These options allow you to specify when to start using daylight savings time. Select a month and time to start from the drop-down menus.

- Select *Fixed* to start daylight savings at a specific Day, Month and Time (an additional field for *Day* is provided when this radio button is selected).
- Select *Occurrence* to start daylight savings at a specified occurrence (additional fields for *Week of the Month*, and *Day of the Week* are provided).

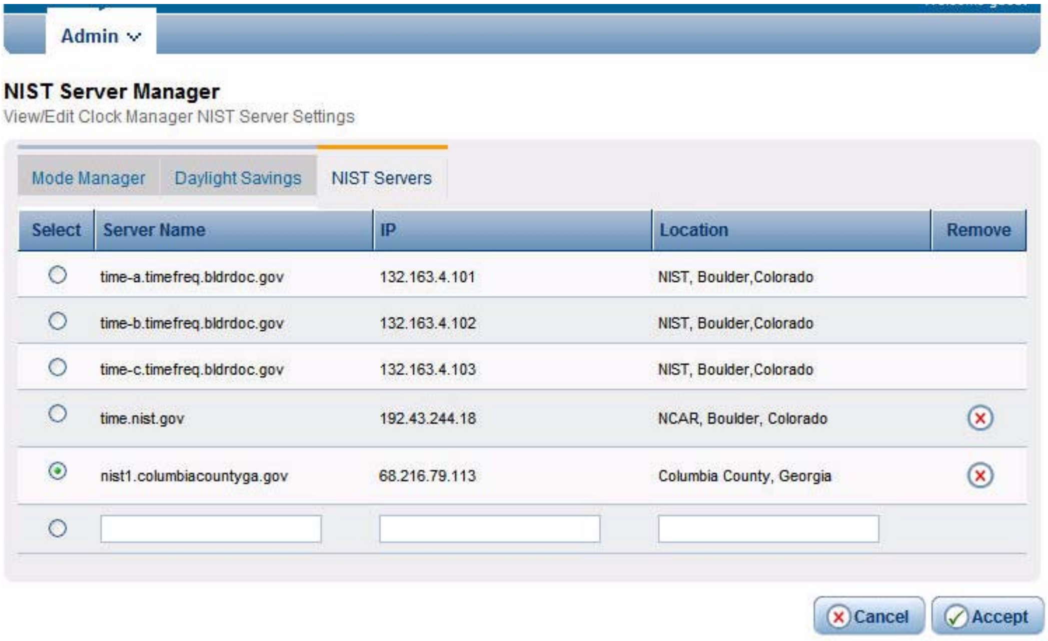
Ends: These options allow you to specify when to stop using daylight savings time. Select a month and time to start from the drop-down menus.

- Select *Fixed* to end daylight savings at a specific Day, Month and Time (an additional field for *Day* is provided when this radio button is selected).
- Select *Occurrence* to end daylight savings at a specified occurrence (additional fields for *Week of the Month*, and *Day of the Week* are provided).

- Click **Accept** to save your changes. Note that changes on this page take effect immediately.
- Click **Cancel** to cancel any changes.

Clock Manager - NIST Servers

Select **NIST Servers** from the Clock Manager sub-menu (or from the main Clock Manager page), and the *NIST Server Manager* page will be displayed (FIG. 20):



NIST Server Manager

View/Edit Clock Manager NIST Server Settings

Select	Server Name	IP	Location	Remove
○	time-a.timefreq.bldrdoc.gov	132.163.4.101	NIST, Boulder,Colorado	
○	time-b.timefreq.bldrdoc.gov	132.163.4.102	NIST, Boulder,Colorado	
○	time-c.timefreq.bldrdoc.gov	132.163.4.103	NIST, Boulder,Colorado	
○	time.nist.gov	192.43.244.18	NCAR, Boulder, Colorado	⊗
●	nist1.columbiacountyga.gov	68.216.79.113	Columbia County, Georgia	⊗
○				

FIG. 20 Clock Manager - NIST Server Manager page

Note that this tab is enabled only if *Network Time* is selected (on the Mode Manager page).

The options on this page allow you to select the NIST server that will be queried at each clock synchronization, and allow you to add more NIST servers to the list.

NOTE

Only one NIST server is selectable at any given time.

To add a NIST server, enter the *NIST Server Name*, *IP Address* and *Location* in the fields provided.

To remove a NIST server from the list, click the *Remove* button.

- Click **Accept** to save your changes. Note that changes on this page take effect immediately.
- Click **Cancel** to cancel any changes.

NetLinx Programming

Overview

It is important to understand that the NXB-KNX cannot configure a KNX system. The NXB-KNX serves a functioning KNX system, and can only access bus elements with permitted use.

NOTE

For a successful connection to a KNX system, expert KNX knowledge and access to a knowledgeable KNX installer is crucial.
A wrongly set reading flag in an actuator or restrictively programmed line coupler are difficult to find without the right analysis tools.

Understanding the KNX Bus

KNX is a bus system: all components are connected to the same line and share the available bandwidth. The KNX bus is a 2-core wire, providing 24V power as well as data transfer between devices.

In contrast to AMX, the KNX system is organized peripherally - there is no "Master" or "Central Controller" controlling communication. Rather, every device may transmit data to any other device. The KNX protocol ensures that only one device transmits at a time, to avoid collisions as much as possible.

All communication is carried out via "*Telegrams*". A Telegram is a data package consisting of the following components:

- Source ID - hardware address of the transmitting device
- Destination Address - group addresses of receiving devices
- User data

A Telegram can be transmitted to several Destination Addresses simultaneously (for instance to switch off all lights in a room at the same time). There is a basic difference between Source IDs and Destination Addresses:

- A *Source ID* is the hardware address of the device transmitting the Telegram.
- A *Destination Address* is a group address characterizing a function.

Thus each device connected to KNX has exactly one Source ID, but may have several Destination Addresses. Furthermore, it is common for several Source IDs (devices) to respond to the same Destination Address.

The KNX installer assigns both address types - the Source IDs describing the type and number of utilized devices (assigned during planning and installation).

Hardware addresses are irrelevant to the NXB-KNX. Destination Addresses are important for AMX programmers, since they define the functions a KNX installation can perform. Functions are actuated by transmitting a certain value to a Destination Address.

The diagram in FIG. 21 gives a graphic overview to the course of communication from the project-oriented Netlinx source code to the NXB-KNX.

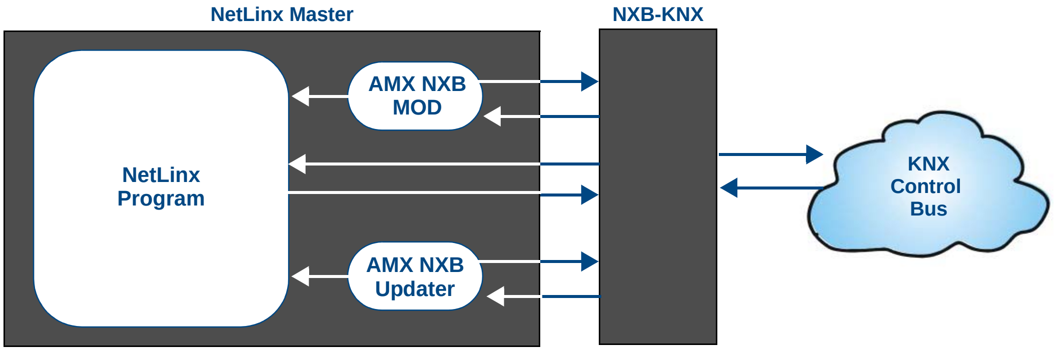


FIG. 21 Course of communication

KNX Bus Diagram

The NXB-KNX is a transparent KNX device and can be connected at any location with the KNX.

In contrast to simple actuators and sensors, the NXB-KNX may be responsible for up to 3,000 Destination Addresses (where a normal dimmer only responds to four Destination Addresses). FIG. 22 provides a basic diagram of a KNX Bus:

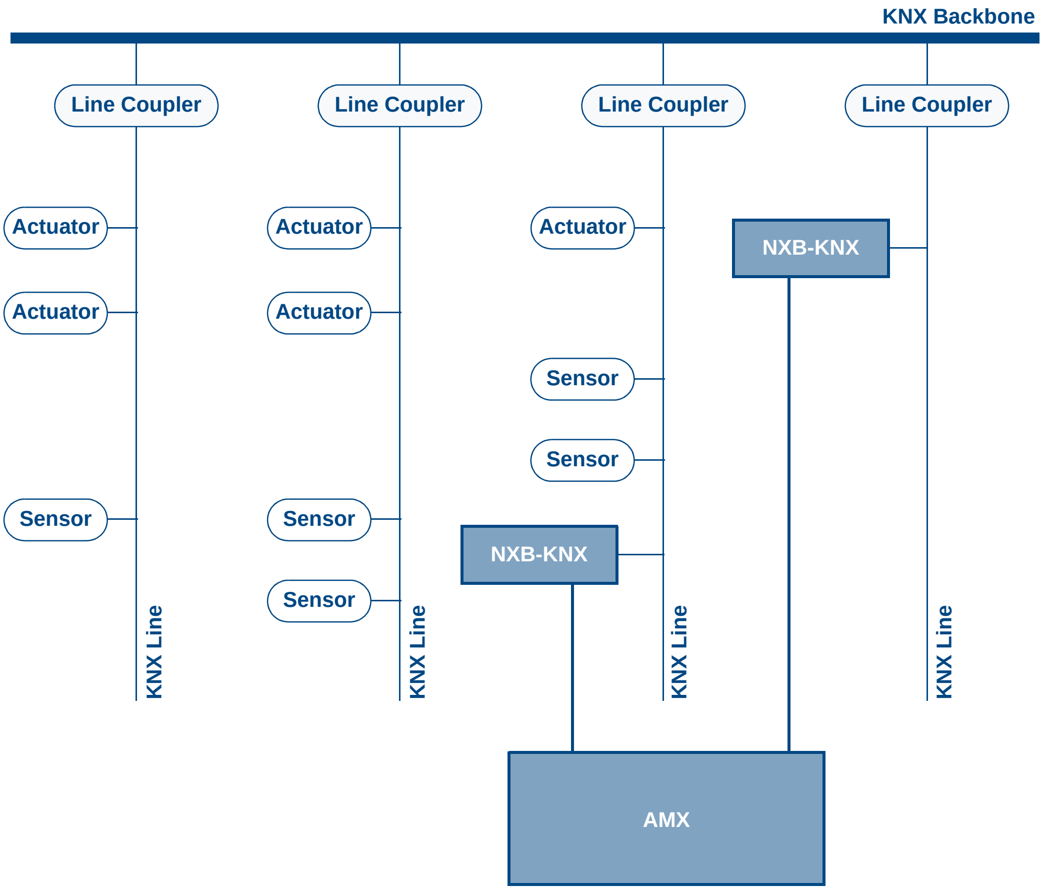


FIG. 22 KNX Bus Diagram

It is important to ensure that the NXB-KNX can respond to all bus Telegrams in question. When using line couplers, careful planning is necessary. The following should be considered:

- Bus Telegrams have to reach the NXB-KNX. If line couplers are inserted between NXB-KNX and the component to be controlled, then the filter tables of the line couplers must be programmed to pass on all relevant Telegrams.
- Older line couplers may be slow. In this case, KNX devices will require a certain amount of time between receiving Telegrams.

NOTE

"Scene" modules often produce a flood of Telegrams being transmitted to all actuators participating in the scene. Under normal circumstances these are different devices, the down time of the line coupler does not matter - each line coupler has enough time to recover before receiving a new Telegram.

The situation with the NXB-KNX is different: the NXB-KNX can read all Telegrams, even with high bus load.

Therefore, it is crucial that activated Actuators are given sufficient time to respond.

Notes on Line Couplers

Telegrams must be intelligently sent across KNX lines by line couplers.

- Line couplers prevent Telegrams within a line from adding traffic load outside its line.
- Line couplers also filter out cross-line Telegrams if its line is not the destination line.

User Data (DPT) Specifications and Requirements

KNX defines the User data in different Telegrams as *Data Point Types* (or "DPT"s)

KNX defines DPT IDs numerically, in the form *major.minor* (for example: **DPT 1.001** or **DPT 1.002)**, where the major ID is designated a data length in bits or bytes (8-bit octets), and the minor ID defines format and encoding.

The same data length may be reused in several DPT *major* IDs. For example, DPT 5s and DPT 6s are
1-Byte in data length, while DPT 7s, DPT 8s and DPT 9s are 2-Bytes in data length.

In essence, the NXB-KNX supports User Data (DPTs) simply in terms of data length, thereby supporting most DPTs.

The supported data lengths are:

Bits	Bytes
• 1-bit	• 1-Byte (=8-bits/octet)
• 2-bit	• 2-Byte
• 4-bit	• 3-Byte
	• 4-Byte
	• 14-Byte Text, HexText

- 6-bit data length DPTs are defined in KNX, but are not widely used. In practice, 1-Byte data lengths replace 6-bit definitions, and are typically used by KNX devices.
- The KNX-defined 8-Byte data length is "date time", but KNX devices typically use 3-Byte DPT 10 "time" and 3-Byte DPT 11 "date" for economy (relative to the lengthier 8-Byte combined format) and for more flexible use.

The module application is responsible for interpreting User Data per each KNX device's definitions.

The NXB-KNX recognizes the most commonly used User Data formats, and translates User Data to simplify most module application responsibilities.

The supported User Data format options are:

- EIS5
- Date
- Time

The NXB-KNX supports the following commonly used DPT (User Data) data lengths:

Supported DPT Data Lengths

Data Length	Description / Example
• 1-bit	DPT 1s are Boolean (switch)
• 2-bit	DPT 2s "1-bit controlled" (control)
• 4-bit (or "Dim4")	DPT 3s "3-bit controlled" (used as on/off with dimmer step values)
• 1-Byte	DPT 5s "8-bit unsigned" (also DPT 4s, DPT 6s, DPT 200s, DPT 201s)
• 2-Byte	DPT 9s "2-octet float" (also DPT 7s, DPT 8s)
• 3-Byte	DPT 10s "time", and DPT 11s "date"
• 4-Byte	DPT 12s, DPT 13s, DPT 14s, DPT 15s "4-octet" (e.g. counter values)
• 14-Byte	DPT 16s "String" (also known as 'Text', 'HexText')

NOTE

*The character sets supported by KNX are **ASCII** and **ISO 8859-1**.*

Integrating with NetLinx

The NXB-KNX is a native ICSP device in NetLinx. The NXB-KNX associates each actuator (actor number) with a corresponding Channel and Level mapping.

For example the value of actor 1 will map to Channel 1 / Level 1, and actor 52 will map to Channel 52 / Level 52. These Channels and Levels are associated with the NXB-KNX device.

The default number of Channels and Levels supported by the NXB-KNX is **256**.

- If additional channels/levels are required to support additional actors the NXB-KNX can be configured to allocate additional resources.
  Refer to “ICSP [ch=n][,lv=m]” on page 24.
- For a full listing and description of all supported NetLinx SEND_COMMANDS and String Feedback, refer to the *NetLinx SEND_COMMANDs* section on page 21.

Channels and Levels

All addresses are available as channels.

The current value is mapped to the corresponding channels of the device.

Channels	
Channel	Description
1 …n (0 < n < 3000)	Mapping of values irrespective of KNX type. Default n = 256

All addresses are available as levels.

For every value change the current value is transmitted as level to the program, for instance to control a bargraph.

Levels	
Level	Description
1 …n (0 < n < 3000)	Mapping of values irrespective of KNX type. Default n = 256

Data Types

Data Types		
Data Type	Description	
Switch	Value '0' or '1'	e.g. Off - On
Control	Value '0' to '3'	e.g. forced operation
4 Bit	Value '0' to '15’	e.g. relative dimming - direction, interval
1 Byte	Value '0' to '255’	e.g. value absolute
2 Byte	Value '0' to '65535’	e.g. floating point value in EIS5 Notation
3 Byte	3 Byte	e.g. Date or Time
4 Byte	4 Byte	
Text	1 to 14 ASCII Characters, String automatically filled with spaces	
HEXText	1 to 14 Byte Hexvalue in ASCII-Notation	

Feedback

Runtime

All actuators/sensors can be configured to feedback to channels and levels via the ICSP command.

In addition feedback is generated in a readable ASCII display - depending on flags - meaning, the raw data are output as time string, date string, floating point display etc.

Example:

Feedback of a 2Byte value, converted according to EIS5 standard (i.e. temperature value).

The corresponding actuator was entered in the filter table with flag "EIS5".

```
KNXAdd (dvKNX, 15, KNX2Byte, '1/0/201', "KNXEIS5")
```

The device will report two feedback with each value change (or as answer to a poll command):

- String 1 from device (value change):

```
SET=15:3175'
```

- String 2 from device:

```
EIS5=15:22.54'
```

or

- String 1 from device (no value change):

```
VAL=15:3175'
```

- String 2 from device:

```
EIS5=15:22.54'
```

Debugging

Example Status feedback:

```
**********************************************************************
*  NXB-KNX: AMX NXB-KNX SN#xxxxxx
*           IP xxx.xxx.xxx.xxx
*           Version AmxKnxApp v2.0.15-KNX service unavailable
*           Running since Jun 18, 2009 2:24:02 PM
*           Servlet started
*           Total Mem: 22369792
*            Used Mem: 11975492
*            Free Mem: 10394300
*      KNX: KNX bus is not connected
*           Send delay is 50 ms
*           Poll delay is 1
*           -------------------------
*           # of 1Bit      : 13
*           # of 2Bit      :  0
*           # of 4Bit      :  2
*           # of 1Byte     :  4
*           # of 2Byte     :  3
*           # of 3Byte     :  2
*           # of 4Byte     :  0
*           # of Text      :  0
*           # of $Text     :  0
*           -------------------------
*           total          : 24
*           -------------------------
*           poll triggers  :  8
*  NetLinx: Online at Jun 18, 2009 2:24:32 PM
*           Device 13001
*           Master xxx.xxx.xxx.xxx
*           Channels = 256, Levels = 256
*           NXBCommandQ highwater = 38
*           Remote logging is on
* LogLevel: Info
**********************************************************************
```

AMX_NXB_MOD Module

The **AMX_NXB_MOD** module is provided to facilitate remote logging from NXB-KNX as well as the "List Save" and "List Load" functions.

The AMX_NXB_MOD module is integrated with the source code as follows:

```
DEFINE_MODULE 'AMX_NXB_MOD' nxbMod(dvKNX)
```

The parameters are as follows:

- **dvKNX** - the physical interface for NXB-KNX, as a NetLinx D:P:S address

AMX_KNX_Updater Module

The **AMX_KNX_Updater** module is optional, and is provided to support implementations (e.g. legacy CommTec projects) that use array values for feedback control.

NOTE

the NXB-KNX supports channels and levels for each actuator. The Updater module is provided to support legacy NetLinx code (which was designed to work with the CommTec EIB device). Moving forward the Updater module could and should be replaced with channel and level event driven feedback from the NXB-KNX, rather than referencing the lKNX_Value array.

The AMX_KNX_Updater module is integrated with the source code as follows:

```
DEFINE_MODULE 'AMX_KNX_Updater' Updater(dvKNX, lKNX_Value)
```

The parameters are as follows:

- **dvKNX** - the physical interface for NXB-KNX, as a NetLinx D:P:S address
- **1KNX_Value** - the central value array of the KNX actuators (type LONG!). No strict size is required for the array: it should be sized appropriately for site-specific optimal performance.

  The *1KNX_Value* array should be defined in the DEFINE_VARIABLE section:

```
DEFINE_VARIABLE
...
LONG lKNX_Value[3000]
...
```

Accessing Actuators On the KNX Bus

To access actuators on the bus, KNX Destination Addresses must be configured on the NXB-KNX. This is done via the **KNX_Table.axi** file (included). This include file maps the Destination Address, type, poll conjunction and additional features to an *actor number* between 1 and 3000. Communication with the actuators is accomplished via this actor number.

KNX_Table.axi Include File

The **KNX_Table.axi** file contains the definition of all actuators on the KNX bus that will be controlled or monitored by the NetLinx system, and is integrated in to NetLinx code via the following source code line:

```
#INCLUDE 'KNX_Table.axi'
```

Refer to the *Sample Program* section on page 30 for more information on the KNX Table and to review sample programs that illustrate the following:

- Structure of KNX Table With Functions From *KNX_Tools.axi* (see page 30)
- Structure of KNX-Table with SEND_COMMANDS (see page 32)

KNX_Tools.axi Include File

Additionally, the **KNX_Tools.axi** file should be integrated to have easy access to commonly used functions, and is integrated in to NetLinx code via the following source code line:

```
#INCLUDE 'KNX_Tools.axi'
```

Refer to the *KNX_Tools.axi* section on page 35 for more information, including a listing of the functions available in *KNX_Tools.axi*.

Analyzing Feedback

Data feedback is analyzed in a DATA_EVENT:

- The feedback is always in STRING format
- One DATA_EVENT is actuated per feedback (exactly one feedback in the DATA.TEXT)

NOTE

In cases of multiple feedback, the corresponding number of events is actuated.
Channel feedback is analyzed in a CHANNEL_EVENT.
Level feedback is analyzed in a LEVEL_EVENT.

NetLinx SEND_COMMANDs

Commands to the module always take place per SEND_COMMAND to the device.

NOTE

***KNX_Tools.axi** provides convenience function equivalents (See the Functions Available In KNX_Tools.axi table on page 35).*

The NXB-KNX supports the following NetLinx commands:

NetLinx SEND_COMMANDs	
Command	Description

ADD=	Adds a KNX group address to list.
	Syntax:
	`ADD=<No>:<Type>:<GrpAdr>[:Flags]`
	***Note**: Flags are optional*
	Parameters:
	• <No> = AMX Number of Actuator (range = 1 - 3000)
	• <Type> = Actuator Type (*Switch*, *Control*, *Dim4*, *1Byte*, *2Byte*, *3Byte*, *4Byte*, *Text*, *HexText*)
	• <GrpAdr> = KNX group address in 2 or 3 grouped display
	• <Flags>:
	EIS5 = Value is reported additionally as ASCII Float Value. The KNX Value is converted according to EIS5 Standard (only valid for 2Byte Actuators)
	Time = Value is reported additionally as ASCII Time (hh:mm:ss).
	***Note**: Only valid for 3Byte Actuators*
	Date = Value is reported additionally as ASCII Date (MM/DD/YY).
	***Note**: Only valid for 3Byte Actuators)*
	PS = Actuator is automatically polled with Start of AMX System
	***Note**: Flags are separated by Commas*
	Examples:
	`SEND_COMMAND dvKNX,'ADD=13:Switch:1/0/11'`
	`SEND_COMMAND dvKNX,'ADD=17:1Byte:4/7/12:PS'`
	`SEND_COMMAND dvKNX,'ADD=45:2Byte:3/0/11:EIS5'`
	`SEND_COMMAND dvKNX,'ADD=12:3Byte:2/1/101:TIME,PS'`

ADR	Definition of output format of KNX group address (Main/Middle/Sub-group *or* Main group/Sub-group).
	Syntax:
	`ADR <Value>`
	Parameters:
	<Value> = 2/3
	Example:
	`SEND_COMMAND dvKNX,'ADR 3'`

NetLinx SEND_COMMANDs (Cont.)

Command	Description

BIND=	Definition of Bind trigger.
	Syntax:
	`BIND=<No>:<No2>`
	***Note**: BIND= will send instruction to <No2> only if <No> is changing its value*
	• When <No> is changed, <No2> is updated with the same value.
	• No telegrams are sent on the KNX bus.
	• The updated actor sends its new value to the master using Set= or Val= and Channel and Level events.
	• Typical use is to bind a feedback address to a control address.
	Parameters:
	• <No>= AMX Number of Actuator (range = 1 - 3000)
	• <No2>= AMX Number of Actuator to be updated (range = 1 - 3000)
	Example:
	`SEND_COMMAND dvKNX, 'BIND=24:11'`

DATE=	Setting the Date.
	***Note**: Only valid for 3Byte Actuators*
	Syntax:
	`DATE=<No>:<Datum>`
	Parameters:
	• <No> = AMX Number of Actuator (range = 1 - 3000)
	• <Date> - date (format = MM/DD/YY)
	Example:
	`SEND_COMMAND dvKNX,'DATE=17:14/08/06'`
	Returns:
	`DATE=<No>:<Value>`
	***Note**: Is transmitted as ADDITIONAL feedback, if in actuator <No> the DATE flag is set.*
	• <No> = AMX Number of Actuator
	• <Value> = Date string in format MM/DD/YY (AMX display)
	Example:
	`DATE=17:08/14/06`

DATE?	Request Date.
	***Note**: Only valid for 3Byte Actuators*
	Syntax:
	`DATE?<No>`
	Parameters:
	• <No> = AMX Number of Actuator
	Example:
	`SEND_COMMAND dvKNX,'DATE?17'`

DEBUGON
(or)
DEBUGON=
	Activate debug reports
	With activated debug report all actuators of the terminal are listed, which can be accessed via KNX. This allows simple diagnostics.
	DEBUGON enables debug and sets level = 1.
	Syntax:
	`DEBUGON=<Level>`
	• Level 1: enables debug
	• Level 2: adds actuator traces
	• Level 3: adds ops traces
	Example:
	`SEND_COMMAND dvKNX,'DEBUGON=1'`

NetLinx SEND_COMMANDs (Cont.)

Command	Description

DEBUGOFF	Deactivate debug reports
	Syntax:
	`DEBUGOFF`
	Example:
	`SEND_COMMAND dvKNX,'DEBUGOFF'`

DEL	Delete Actuator from Table
	Syntax:
	`DEL <Value>`
	Parameters:
	<Value> = AMX Number of Actuator (range = 1 - 3000)
	Example:
	`SEND_COMMAND dvKNX,'DEL 3'`

EIS5=	Setting an EIS5 value. Converts a floating-point value mapped in ASCII into 2Byte EIS5 value before transfer.
	***Note**: Only valid for 2Byte Actuators*
	Syntax:
	`EIS5=<No>:<floating point value>`
	Parameters:
	• <No> = AMX Number of Actuator (range = 1 - 3000)
	• <Floating Point Value> = Number (range = –671088.64 - 670760.96)
	Example:
	`SEND_COMMAND dvKNX,'EIS5=12:24.3'`
	Returns: Feedback of a value in ASCII floating point display. The actuator value to be coded according to EIS5.
	`EIS5=<No>:<Value>`
	***Note**: Is transmitted as ADDITIONAL feedback, if in actuator <No> the EIS5 flag is set.*
	• <No> = AMX Number of Actuator
	• <Value> = Floating Point Value (String), converted according to EIS Specification
	Example:
	`EIS5=12:20.25`

EIS5?	Request EIS5 value. Converts the 2Byte raw data into ASCII string with floating point notation.
	***Note**: Only valid for 2Byte Actuators*
	Syntax:
	`EIS5?<No>`
	Parameters:
	• <No> = AMX Number of Actuator (range = 1 - 3000)
	Example:
	`SEND_COMMAND dvKNX,'EIS5?12'`

ERRORM= (Feedback Only)	Error message from NXB-KNX and/or bus. ***Note**: The messages are only for information.* Each message may reflect an actual command, followed by the error condition encountered. Example feedback: `ERRORM=(del 99) 99 not found`

NetLinx SEND_COMMANDs (Cont.)

Command	Description

GET=
GET?
	Request Value of Actuator stored in the module
	Note: Creates no Telegram on KNX (use for synchronization of master-to-master connection.
	Syntax:
	`GET=<No>`
	`GET?<No>`
	Parameters:
	• <No> = AMX Number of Actuator (range = 1 - 3000)
	Example:
	`SEND_COMMAND dvKNX,'GET=17'`

HELP (or) /?	Output of available Terminal Commands
	Syntax:
	`HELP (or)/?`
	Example:
	`SEND_COMMAND dvKNX,'HELP'`

ICSP	Configures the number of channels and/or levels available.
	• Requests *n* channels to be allocated.
	• Requests *m* levels to be allocated.
	Syntax:
	`ICSP [ch=n][,lv=m]`
	• Channel and level counts can be specified alone or together, and in any order.
	• Use this command to override the default number of channels and/or levels.
	• Default for Channels and Levels = **256**.
	Note: Caution is advised when expanding resources, since the Central Controller's resources need to be considered.
	Examples:
	`SEND_COMMAND dvKNX, 'icsp ch=128'`
	`SEND_COMMAND dvKNX, 'icsp lv=512'`
	`SEND_COMMAND dvKNX, 'icsp ch=256,lv=384'`

LIST	List all entered actuators.
	• Lists all entered actuators with AMX number, KNX group address, current value, set flags (if applicable) and resulting additional feedback values.
	• Lists sum of individual Types, sum of all actuators.
	Syntax:
	`LIST`
	Example:
	`SEND_COMMAND dvKNX,'LIST'`

LIST <No>	List *one* actuator (AMX number) with KNX group address, current value, set flags (if applicable) and resulting additional feedback values.
	Syntax:
	`LIST <No>`
	Parameters:
	• <No> = AMX Number of Actuator (range = 1 - 3000)
	Example:
	`SEND_COMMAND dvKNX,'LIST 17'`

NetLinx SEND_COMMANDs (Cont.)	
Command	Description

LIST <No> <No2>	List actuators in the range of <No> to <No2> (AMX numbers) with KNX group address, current value, set flags (if applicable) and resulting additional feedback values
	Syntax:
	`LIST <No>-<No2>`
	Parameters:
	• <No> = AMX Number of Actuator (range = 1 - 3000) (Start)
	• <No2> = AMX Number of Actuator (range = 1 - 3000) (End)
	Example:
	`SEND_COMMAND dvKNX,'LIST 17-24'`

LIST <Type>	List all entered actuators with AMX number, KNX group address, current value, set flags (if applicable) and resulting additional feedback values.
	Also provides a sum of all actuators of one Type.
	Syntax:
	`LIST <Type>`
	Parameters;
	• <Type> = Data Type, where:
	SW or SWITCH - 1Bit Actuators
	CO or CONTROL = 2Bit Actuators
	D4 or DIM4 = 4Bit Actuators
	1B or 1BYTE = 1Byte Actuators
	2B or 2BYTE = 2Byte Actuators
	3B or 3BYTE = 3Byte Actuators
	4B or 4BYTE = 4Byte Actuators
	Example:
	`SEND_COMMAND dvKNX,'LIST 1B'`

LIST BIND	List all bind triggers with AMX number and KNX group address.
	Syntax:
	`LIST BIND`
	Example:
	`SEND_COMMAND dvKNX, 'LIST BIND'`

LIST FLAGS	List *all* actuators with assigned flags in table with KNX group address, current value, set flags (if applicable) and resulting additional feedback values
	Syntax:
	`LIST FLAGS`
	Example:
	`SEND_COMMAND dvKNX,'LIST FLAGS'`

LIST GAPS	List free (unused) AMX numbers Example: `SEND_COMMAND dvKNX,'LIST GAPS'`

NetLinx SEND_COMMANDs (Cont.)

Command	Description

LIST LOAD	Reads the entries in table written with LIST SAVE from CF and back.
	• The current table is replaced with the read one.
	• File name is optional.
	• If no file name is specified, the default file name is used.
	• Default file name: KNXTableNX.TXT
	***Note**: In terminal connection with master the already available files on CF can be listed by entering "List" (no SEND_COMMAND to device).*
	Syntax:
	`LIST LOAD [<Filename>]`
	Examples:
	`SEND_COMMAND dvKNX,'LIST LOAD'`
	`SEND_COMMAND dvKNX,'LIST LOAD MyTable.txt'`

LIST POLL	List all poll triggers with AMX number and KNX group address
	Syntax:
	`LIST POLL`
	Example:
	`SEND_COMMAND dvKNX,'LIST POLL'`

LIST SAVE	Writes the current KNX table, including poll trigger, as text file on CF.
	This file can be edited with simple text editor.
	The entries correspond with the structure of the regular table. Thus a table can be buffered, modified (i.e. delete or add actuators) and finally reconstructed with LOAD (see above)
	• File name is optional.
	• If no file name is specified, the default file name is used.
	• Default file name: KNXTableNX.TXT
	***Note**: In monitor connection with master the already available files on CF can be listed by entering "list" (no SEND_COMMAND to device).*
	Syntax:
	`LIST SAVE [<Filename>]`
	Examples:
	`SEND_COMMAND dvKNX,'LIST SAVE'`
	`SEND_COMMAND dvKNX,'LIST SAVE MyTable.txt'`

LIST SUM	List sum of all types, sum of all actuators. Example: `SEND_COMMAND dvKNX,'LIST SUM'`
LIST WATCH	List currently observed actuator with KNX group address, current value, set flags (if applicable) and resulting additional feedback values Example: `SEND_COMMAND dvKNX,'LIST WATCH'`

POLL=
POLL?
	Request current value of actuator.
	***Note**: Creates a Telegram on KNX (For synchronization of master-to-master connection, only use GET command).*
	Syntax:
	`POLL=<No>`
	`POLL?<No>`
	Parameters:
	• <No> = AMX Number of Actuator (range = 1 - 3000)
	Examples:
	`SEND_COMMAND dvKNX,'POLL=17'`
	`SEND_COMMAND dvKNX,'POLL?17'`

NetLinx SEND_COMMANDs (Cont.)

Command	Description

POLLDELAY=	Set pause between (automatic) value requests
	Syntax:
	`POLLDELAY=<Value>`
	Parameters:
	• <Value> = 0-2 (default = 1)
	***Note**: 0 stands for very fast and should not be used, because otherwise the NXB-KNX would create a high bus load. For installations with slow bus couplers (BCU1), the value 2 should be selected.*
	Example:
	`SEND_COMMAND dvKNX,'POLLDELAY=2'`

POLLSTART	Triggers the pollstart action.
	Requests current value of all actuators that have been configured with the 'PS' flag (see **Add=**).
	When the optional actuator range is specified, only those actuators are affected.
	The POLLDELAY setting affects the rate poll commands are sent to the KNX bus.
	• This command is typically sent at the completion of the NXB-KNX configuration.
	• This command is automatically executed by the NXB-KNX when the KNX bus is connected.
	Syntax:
	`POLLSTART [<No>-<No2>]`
	Parameters:
	• <No> = AMX Number of Actuator (range = 1 - 3000) (Start)
	• <No2> = AMX Number of Actuator (range = 1 - 3000) (End)
	Example:
	`POLLSTART`
	`POLLSTART 25-75`

SEARCH	Search for KNX group address
	Syntax:
	`SEARCH <Groupaddress>`
	***Note**: Here 2 and 3 grouped mapping is accepted.*
	Caution: The addresses **7 / 715** and **7 / 2 /203** are i.e. identical KNX group addresses.
	Example:
	`SEND_COMMAND dvKNX,'SEARCH 1/0/101'`

SENDDELAY=	Delay between commands to KNX.
	• Value is the time in 1/10 sec.
	• The value 0 deactivated the delay.
	Syntax:
	`SENDDELAY=<Value>`
	Examples:
	`SEND_COMMAND dvKNX,'SENDDELAY=0'`
	`SEND_COMMAND dvKNX,'SENDDELAY=2'`

NetLinx SEND_COMMANDs (Cont.)

Command	Description

SET=	Set Actuator
	Syntax:
	`SET=<No>:<Value>`
	***Note**: Observe actuator type in value range! The module limits the value range automatically to max valid range of the accessed actuator.*
	Parameters:
	• <No> = AMX Number of Actuator (range = 1 - 3000)
	• <Value> = Value to be set
	Example:
	`SEND_COMMAND dvKNX,'SET=5:1'`
	Returns: Report of a value change
	`SET=<No>:<Value>`
	***Note**: With the NXB_KNX_Updater module, the feedback array (type LONG) is automatically updated, unchanged values are reported as VAL = (see below).*
	• <Nr> = AMX Number of Actuator
	• <Value> = new Value of Actuator (raw data)
	Example feedback:
	`SET=8:1`

STATE?	Output of current module status in terminal Example: `SEND_COMMAND dvKNX,'STATE?'`

STATUS	List general status information for:
	• AMX hardware
	• KNX bus status
	• Active KNX table
	Syntax:
	`STATUS`
	Example:
	`SEND_COMMAND dvKNX,'STATUS'`

TIME=	Set time
	***Note**: Only valid for 3 Byte Actuators*
	Syntax:
	`TIME=<No>:<Time>`
	Parameters:
	• <No> = AMX Number of Actuator (range = 1 - 3000)
	• <Time> = Time in format hh:mm:ss
	Example:
	`SEND_COMMAND dvKNX,'TIME=8:13:15:00'`

NetLinx SEND_COMMANDs (Cont.)

Command	Description

TIME?	Request of time
	Note: Only valid for 3 Byte Actuators
	Syntax:
	`TIME?<No>`
	Parameters:
	• <No> = AMX Number of Actuator (range = 1 - 3000)
	Example:
	`SEND_COMMAND dvKNX,'TIME?8'`
	Returns: Feedback of Time
	`TIME=<No>:<Value>`
	***Note**: Is transmitted as ADDITIONAL feedback, if in actuator <No> the time flag is set.*
	• <No> = AMX Number of Actuator
	• <Value> = Time string (format = hh:mm:ss)
	Example feedback:
	`Time=18:09:55:30`

VAL= (Feedback Only)	Feedback of an unchanged Value (for instance after GET or POLL): `VAL=<No>:<Value>` Variables: • <No> = AMX Number of Actuator • <Value> = Value of Actuator
VERSION	Output of current module version in Terminal Example: `SEND_COMMAND dvKNX,'VERSION'`

WATCH	Activate observation function for actuator.
	All value changes are recorded on monitor with KNX group address, current value, set flags and resulting additional feedback values.
	Syntax:
	`WATCH <No>`
	Parameters:
	• <No> = AMX Number of Actuator (range = 0 - 3000)
	• 0 = deactivation of observation
	Example:
	`SEND_COMMAND dvKNX,'WATCH 12'`

WATCH OFF	Deactivate observation function for actuator Syntax: `WATCH OFF`

WHEN=	Definition of Poll trigger
	Syntax:
	`WHEN=<No>:<No2>`
	***Note**: WHEN= will send instruction to <No2> only if <No> is changing its value.*
	Parameters:
	• <No> = AMX Number of Actuator (range = 1 - 3000)
	• <No2> = AMX Number of Actuator to be polled (range = 1 - 3000)
	Example:
	`SEND_COMMAND dvKNX,'WHEN=32:12'`

Sample Program

KNX Table

All actuators to be switched/set/controlled need to be provisioned on the NXB-KNX. In this example it is achieved with the use of the KNX_Table.axi file. All provisioning commands are listed in the 'ONLINE' for the NXB-KNX device. Other options are possible however this method is preferred. The method will guarantee that actuators will be synchronized between the master and the NXB-KNX

NOTE

***Recommendation**: Use the version with help function (example 1, see below). In this version less typing errors will occur and the compiler can perform several checks.*

Poll triggers will only be accepted by the NXB-KNX if the polling and polled addresses have already been defended.

NOTE

***Recommendation**: define poll triggers after all actors have been defined.*

Additionally, a snapshot of an active configuration may be saved and loaded to/from the master's internal file system.

- Refer to “LIST SAVE [<Filename>]” on page 26.
- Refer to “LIST LOAD [<Filename>]” on page 26.
- Refer to “Example 3 - Load Configuration from File” on page 33.

Notes For Programming

Predefined functions are available for control to generate the SEND_COMMANDs for the NXB-KNX.

NOTE

***Recommendation**: Use these functions, less typing errors will occur and the compiler can perform several checks.*

These functions are in the **KNX_Tools.axi** include file (see the *KNX_Tools.axi* section on page 35).

Example 1 - Structure of KNX Table With Functions From KNX_Tools.axi

```
MODULE_NAME='KNX_Table_NXB_A'(DEV dvNxbKnx)

DEFINE_VARIABLE
integer counter
float waitVal

DEFINE_START
Counter=0
waitVal = .2

#INCLUDE 'KNX_Tools.axi'

DEFINE_EVENT

DATA_EVENT [dvNxbKnx]
  {
    ONLINE:  //Start configuration upload when NXB-KNX comes online.
      {
        wait 10 //1 second delay
          {
            counter = 1
          }
      }
  }
DEFINE_PROGRAM

WAIT waitVal
```

```
{
  SWITCH(Counter)  //Send config command in groups.
                   //Caution avoid sending large quantities of config commands without
                   //intermittent wait intervals.
  {
    CASE 1:
      {
        KNXAdd(dvNxbKnx, 1, knxSWITCH, '1/1/0', "")             // Light 1 switch
        KNXAdd(dvNxbKnx, 2, knxSWITCH, '1/1/1', "")             // Light 2 switch
        KNXAdd(dvNxbKnx, 3, knxSWITCH, '1/1/2', "")             // Light 3 switch
        KNXAdd(dvNxbKnx, 4, knxSWITCH, '1/1/3', "")             // Light 4 switch
        KNXAdd(dvNxbKnx, 5, knxSWITCH, '1/1/4', "")             // Light 5 switch
        KNXAdd(dvNxbKnx, 6, knxSWITCH, '1/1/5', "")             // Light 6 switch
      }
    CASE 2:
      {
        KNXAdd(dvNxbKnx, 7, knxSWITCH, '1/1/30', "knxPollstart") // Light 1 status
        KNXAdd(dvNxbKnx, 8, knxSWITCH, '1/1/31', "knxPollstart") // Light 2 status
        KNXAdd(dvNxbKnx, 9, knxSWITCH, '1/1/32', "knxPollstart") // Light 3 status
        KNXAdd(dvNxbKnx, 10, eibSwitch, '1/1/33', "eibPollstart") // Light 4 status
        KNXAdd(dvNxbKnx, 11, knxSWITCH, '1/1/34', "knxPollstart") // Light 5 status
        KNXAdd(dvNxbKnx, 12, knxSWITCH, '1/1/35', "knxPollstart") // Light 6 status
      }
    CASE 3:
      {
       KNXAdd(dvNxbKnx, 20, knxDim4, '1/1/14', "")             // Dimmer relative light 5
       KNXAdd(dvNxbKnx, 21, knx1Byte, '1/1/24', "")            // Dimmer absolute light 5
       KNXAdd(dvNxbKnx, 22, knx1Byte, '1/1/44', "knxPollstart") // Dimmer feedback light 5
       KNXAdd(dvNxbKnx, 24, knxDim4, '1/1/15', "")             // Dimmer relative light 6
       KNXAdd(dvNxbKnx, 25, knx1Byte, '1/1/25', "")            // Dimmer absolute light 6
       KNXAdd(dvNxbKnx, 26, knx1Byte, '1/1/45', "knxPollstart") // Dimmer feedback light 6
     }
    CASE 4:
     {
      KNXAdd(dvNxbKnx, 27, knx2Byte, '1/3/4', "knxEIS5, ',',knxPollstart") // Temp Actual
      KNXAdd(dvNxbKnx, 28, knx2Byte, '1/3/5', "knxEIS5, ',',knxPollstart") // Temp Setpoint
                                                                               readable

      KNXAdd(dvNxbKnx, 29, knx2Byte, '1/3/6', "knxEIS5")                  // Temp Setpoint
                                                                               writeable
      KNXAdd(dvNxbKnx, 31, knx3Byte, '1/4/0', "knxTIME, ',',knxPollstart") // Time
      KNXAdd(dvNxbKnx, 32, knx3Byte, '1/4/1', "knxDATE, ',',knxPollstart") // Date
      KNXAdd(dvNxbKnx, 33, knxSWITCH, '1/1/200', "")                  // All lights ON/OFF
      KNXAdd(dvNxbKnx, 38, knxSWITCH, '1/1/120', "")                  // Scene ABC
      KNXAdd(dvNxbKnx, 39, knxSWITCH, '1/1/121', "")                  // Scene XYZ
     }
    CASE 5:
     {
      KNXAdd(dvNxbKnx, 34, knxDim4, '1/2/0', "")             // Blind A Up / Down
      KNXAdd(dvNxbKnx, 25, knx1Byte, '1/2/6', "")           // Blind B Position
      KNXAdd(dvNxbKnx, 36, knxDim4, '1/2/1', "")             // Blind B Up / Down
      KNXAdd(dvNxbKnx, 37, knx1Byte, '1/2/7', "")           // Blinds B Position
     }
    CASE 6:
     {
      KNXWhenPoll(dvNxbKnx, 5, 22)                           // Polltrigger
      KNXWhenPoll(dvNxbKnx, 20, 22)                          // Polltrigger
      KNXWhenPoll(dvNxbKnx, 21, 22)                          // Polltrigger
      KNXWhenPoll(dvNxbKnx, 22, 5)                           // Polltrigger
      KNXWhenPoll(dvNxbKnx, 6, 26)                           // Polltrigger
      KNXWhenPoll(dvNxbKnx, 24, 26)                          // Polltrigger
      KNXWhenPoll(dvNxbKnx, 25, 26)                          // Polltrigger
      KNXWhenPoll(dvNxbKnx, 26, 6)                           // Polltrigger
      SEND_COMMAND dvNxbKnx,"'pollstart'"   //Indicates to NXB-KNX that configuration
                                              is complete
      SEND_COMMAND dvNxbKnx,"'status'"      //report log from NXB-KNX with current
                                              status of actors
     }
```

```
          DEFAULT: Counter = 0
      }// Switch
      IF (Counter)
      {
        Counter ++
      }// IF (Counter)
}// WAIT
```

Example 2 - Structure of KNX-Table with SEND_COMMANDS

```
MODULE_NAME='KNX_Table_NXB_A'(DEV dvNxbKnx)

DEFINE_VARIABLE
integer counter
float waitVal

DEFINE_START
Counter=0
waitVal = .2

#INCLUDE 'KNX_Tools.axi'

DEFINE_EVENT

DATA_EVENT [dvNxbKnx]
{
  ONLINE: //Start configuration upload when NXB-KNX comes online.
    {
      wait 10 //1 second delay
      {
        counter = 1
      }
    }
}
DEFINE_PROGRAM

WAIT waitVal
{
  SWITCH(Counter)  //Send config command in groups.
                   //Caution avoid sending large quantities of config commands
                   //without intermittent wait intervals.
  {
    CASE 1:
      {
        SEND_COMMAND DATA.DEVICE, "'ADD=5:Switch:1/1/4'"         // Light 5 On/Off
        SEND_COMMAND DATA.DEVICE, "'ADD=6:Switch:1/1/5'"         // Light 6 On/Off
        SEND_COMMAND DATA.DEVICE, "'ADD=11:Switch:1/1/34:PS'"    // Light 5 status
        SEND_COMMAND DATA.DEVICE, "'ADD=12:Switch:1/1/35:PS'"    // Light 6 status
        SEND_COMMAND DATA.DEVICE, "'ADD=20:Dim4:1/1/14'"         // Dimmer relative light 5
        SEND_COMMAND DATA.DEVICE, "'ADD=21:1Byte:1/1/24'"        // Dimmer relative light 5
        SEND_COMMAND DATA.DEVICE, "'ADD=22:1Byte:1/1/44:PS'"     // Dimmer feedback light 5
        SEND_COMMAND DATA.DEVICE, "'ADD=24:Dim4:1/1/15'"         // Dimmer relative light 6
        SEND_COMMAND DATA.DEVICE, "'ADD=25:1Byte:1/1/25'"        // Dimmer absolute light 6
        SEND_COMMAND DATA.DEVICE, "'ADD=26:1Byte:1/1/45:PS'"     // Dimmer feedback light 6
        SEND_COMMAND DATA.DEVICE, "'ADD=33:Switch:1/1/200'"      // All lights ON/OFF
      }
    CASE 2:
      {
        SEND_COMMAND DATA.DEVICE, "'WHEN=5:22'"     // Polltrigger
        SEND_COMMAND DATA.DEVICE, "'WHEN=20:22'"    // Polltrigger
        SEND_COMMAND DATA.DEVICE, "'WHEN=21:22'"    // Polltrigger
        SEND_COMMAND DATA.DEVICE, "'WHEN=22:5'"     // Polltrigger
        SEND_COMMAND DATA.DEVICE, "'WHEN=6:26'"     // Polltrigger
        SEND_COMMAND DATA.DEVICE, "'WHEN=24:26'"    // Polltrigger
        SEND_COMMAND DATA.DEVICE, "'WHEN=25:26'"    // Polltrigger
        SEND_COMMAND DATA.DEVICE, "'WHEN=26:6'"     // Polltrigger
        SEND_COMMAND DATA.DEVICE,"'pollstart'"      // Indicates to NXB-KNX that configuration
                                                       is complete
        SEND_COMMAND DATA.DEVICE,"'status'"         //report log from NXB-KNX
                                                      with current status of actors
      }
      DEFAULT: Counter = 0
    }                           // Switch
IF (Counter)
  {
    Counter ++
  }                            // IF (Counter)
}                              // WAIT
```

Example 3 - Load Configuration from File

The configuration can be read and generated from/to a file on the master file system. The reading of the file can for instance be started in the ONLINE section of the interface.

```
...
DATA_EVENT[dvKNX]
{
  ONLINE :
  {
    SEND_COMMAND dvKNX,'LIST LOAD MyTable.txt'
  }
}
...
```

NOTE

Comments at the end of a line must be separated by at least one space and are initiated with "//".
Only one command per line is permitted.
Leading spaces are ignored.
Lines starting with "//" are ignored.

```
// Table written <DATE:TIME>
// ----------------------------
// Actors / Addresses / Flags
// ----------------------------
ADD=1:Switch:1/0/1             // Light 1 On/Off
ADD=2:Switch:1/0/2             // Light 2 On/Off
ADD=3:Switch:1/0/3             // Light 3 On/Off
ADD=4:Switch:1/0/11:PS         // Light 1 Status, poll on Start
ADD=5:Switch:1/0/12:PS         // Light 2 Status, poll on Start
ADD=6:Switch:1/0/13:PS         // Light 3 Status, poll on Start
ADD=7:Switch:1/0/21            // Scene 1+2
ADD=8:Switch:1/0/22            // Scene 3+4
ADD=9:Switch:1/0/31            // Blinds up/down
ADD=10:Switch:1/0/32           // Blinds shutter
ADD=11:Switch:1/0/111          // Dimmer On/Off
ADD=12:Dim4:1/0/112            // Dimmer relative
ADD=13:1Byte:1/0/113           // Dimmer absolute
ADD=14:1Byte:1/0/114:PS        // Dimmer read Value, poll on Start
ADD=15:2Byte:1/0/201:EIS5,PS   // analog Value, poll on Start
ADD=16:1Byte:1/0/203           // analog Value
ADD=17:3Byte:1/0/205:Time,PS   // Time, poll on Start
ADD=18:3Byte:1/0/206:Date,PS   // Date, poll on Start
// -------------
// Polltrigger :
// -------------
WHEN=1:2                      // Polltrigger
WHEN=1:3                      // Polltrigger
WHEN=11:14                    // Polltrigger
WHEN=12:14                    // Polltrigger
WHEN=13:14                    // Polltrigger
WHEN=14:11                    // Polltrigger
```

Example 4 - Main Program

```
DEFINE_DEVICE
dvKNX = 13001:1:0
dvTP = 10002:1:0

DEFINE_CONSTANT
...

DEFINE_VARIABLE
VOLATILE LONG lKNX_Value[5000] // Feedback array
...

DEFINE_START
...
#INCLUDE 'KNX_Tools.axi'
#INCLUDE 'KNX_Table.axi'

DEFINE_MODULE 'AMX_KNX_Updater' Updater(dvKNX, lKNX_Value)    //Module handles update
                                                              //of array for feedback control
DEFINE_MODULE 'AMX_NXB_MOD' nxbMod(dvKNX)                     //Module handles remote
                                                              //logging from NXB-KNX
                                                              //as well as facilitates
                                                              //List Save and
                                                              //List Load functions
DEFINE_EVENT
...
DATA_EVENT[dvKNX]
{
  ONLINE :
  {
    SEND_COMMAND dvKNX,'LIST LOAD MyTable.txt'
  }
}

BUTTON_EVENT[dvTP,1]
{
  PUSH:
  {
    KNXSet(dvKNX,1,1)      // Light 1 ON
    KNXSet(dvKNX,16,128)   // Ballast to 50% Light 2
    KNXSet(dvKNX,12,10)    // Dimmer up Light 3
  }
  RELEASE:
  {
    KNXSet(dvKNX,12,0)     // Dimmer Stop Light 3
  }
}

CHANNEL_EVENT [dvKNX, 2]   // Feedback Light 1
{
  ON:
  {
    ON[dvTp,31]
  }
  OFF:
  {
  OFF[dvTp,31]
  }
}

LEVEL_EVENT[dvKNX,21]   //Feedback Level light 2
{
  SEND_LEVEL dvTP,1,LEVEL.VALUE
}

DEFINE_PROGRAM
```

KNX_Tools.axi

We recommend not to use the send commands directly, but always use the functions of this include file. The compiler has the opportunity to avoid typing errors already during compiling. Additional typing is avoided. This file also provides absolute terms for relative dimming and blinds control:

```
// Constants for dimming Lights
KNX_DIM_UP = 9 //Brighter
KNX_DIM_DN = 1 //Darker
KNX_DIM_SP = 0 //Dimming Stop
// Constants for blind control
KNX_DIR_UP   = 1 //UP
KNX_DIR_DOWN = 9 //Down
KNX_DIR_STOP = 0 //Stop
```

Functions Available In KNX_Tools.axi

The following functions are available in file KNX_Tools.axi for programming:

Functions Available In KNX_Tools.axi	
Function	Description

KNXSet	Sets actuator <actor No> to <Value>.
	Syntax:
	`KNXSet (<NXB-KNX Device >,<actor No>,<Value>)`
	Note*: The module limits the value range automatically to the maximum range of the selected actuator type.*
	Example:
	`KNXSet (dvKNX,13,1)`

KNXGet	Gets the value of actuator <actor No> to <Value> stored in module.
	Syntax:
	`KNXGet (<NXB-KNX Device>,<actor No>)`
	Example:
	`nVAL = KNXGet (dvKNX,13)`

KNXPoll	Polls the actuator <actor No>
	Syntax:
	`KNXPoll (<NXB-KNX Device>,<actor No>)`
	Example:
	`KNXPoll (dvKNX,13)`

KNXAdd	Adds entry to KNX table (description of parameters see above).
	Syntax:
	`KNXAdd (<NXB-KNX Device>,<actor No>,<Type>,<Group Address>,<Flags>)`
	Example:
	`KNXAdd (dvKNX,13,KNX2Byte,'1/0/206',"knxPollstart")`

KNXWhenPoll	Adds a poll trigger.
	Syntax:
	`KNXWhenPoll (<NXB-KNX Device>,<actor No1>,<actor No2>)`
	Note*: Value report from <actor No1> triggers polling on <actor No2>.*
	Example:
	`KNXWhenPoll (dvKNX,13,20)`

KNXString2Array	Converts comma separated Feedback from 14 Byte Hex into Integer Array with 14 chars.
	Syntax:
	`KNXString2Array (<CHAR sArray[]>)`
	Example:
	`nArray = KNXString2Array (sArray)`

KNXArray2String	Converts Integer arrays with 14 chars to comma separated Array for 14 Byte Hex Type.
	Syntax:
	`KNXArray2String (<Integer nArray[]>)`
	Example:
	`sArray = KNXArray2String (nArray)`

Cross-Line Communication

Overview

In many cases cross-line communication is required. In order to enable cross line communication a KNX programmer will need to utilize the AMX NXB-KNX Virtual Device. This ETS device entry will serve as the NXB-KNX device in ETS3.

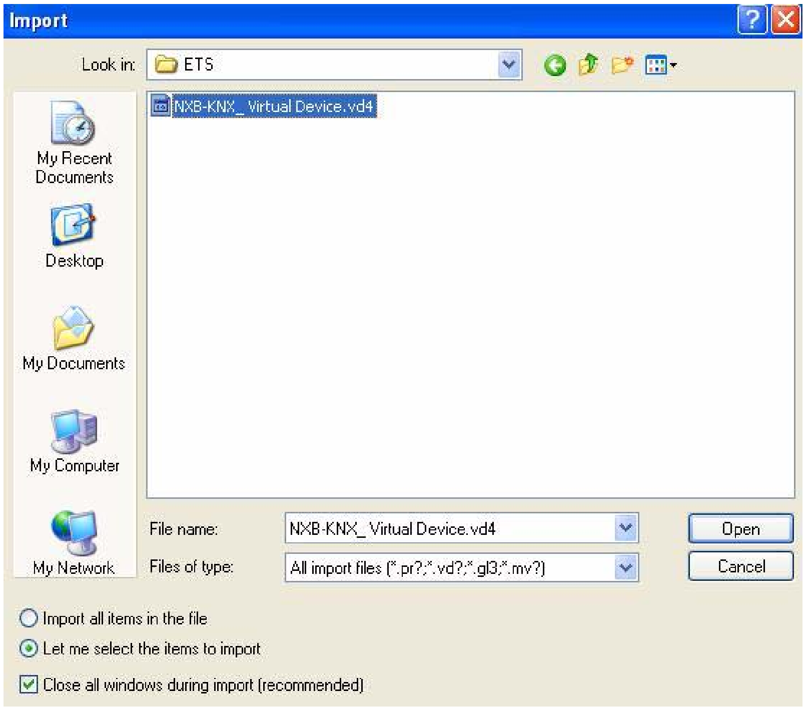
The NXB-KNX is not a native KNX device and so it cannot be directly programmed from within ETS3. The AMX NXB-KNX Virtual Device will allow a programmer to configure cross line communication between KNX devices and the NXB-KNX.

The AMX NXB-KNX Virtual Device, once configured as desired, will allow ETS3 to calculate the appropriate routing tables for line and area couplers.

Integrating the NXB-KNX Virtual Device Into An ETS3 Project

The following are the basic steps for integrating the NXB-KNX Virtual Device into an existing ETS project:

1. Open an existing ETS3 project.
2. Select **File** > **Import** to invoke the *Import* dialog (FIG. 23):



File name: NXB-KNX_ Virtual Device.vd4

Files of type: All import files (*.pr?;*.vd?;*.gl3;*.mv?)

○ Import all items in the file

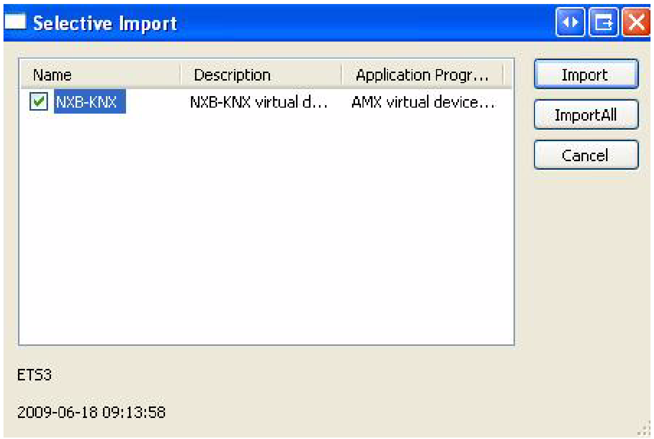
● Let me select the items to import

☑ Close all windows during import (recommended)

FIG. 23 ETS3 - Import dialog

3. Locate and select the **NXB-KNX Virtual Device.vd4** file, and click **Open**.

   This action invokes the *Selective Import* dialog (FIG. 24):



Name	Description	Application Progr...
☑ NXB-KNX	NXB-KNX virtual d...	AMX virtual device...

ETS3

2009-06-18 09:13:58

FIG. 24 Selective Import dialog

4. Verify that **NXB-KNX** is selected, and click **Import**.

Adding the Virtual Device to the ETS3 Project

Once the import procedure is complete, the virtual device must be added to the ETS3 project:

1. Identify the appropriate *Area* and *Line* at which the physical NXB-KNX will be connected, and right-click on the Line name (heading) to access the context menu (FIG. 25):

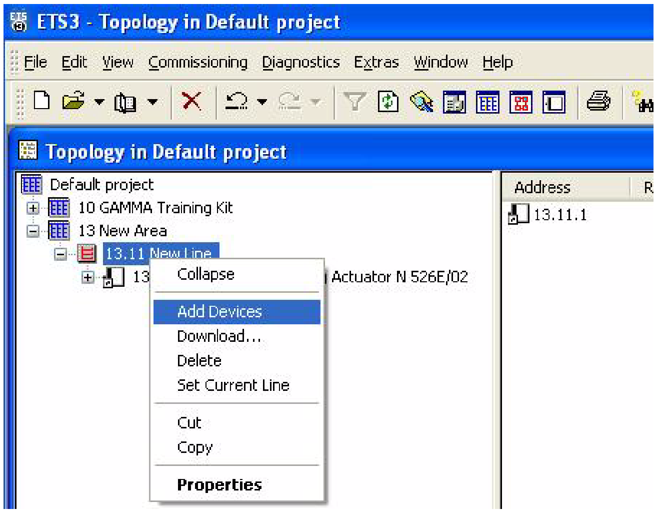
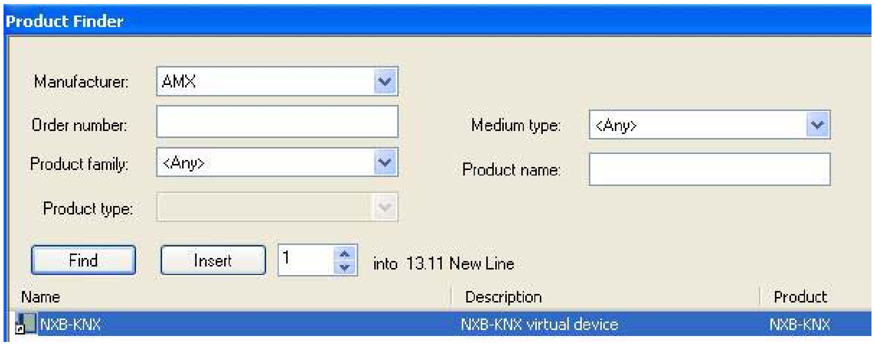


FIG. 25 ETS3 - Topology in Default Project - context menu

2. Select **Add Devices** to invoke the *Product Finder* dialog (FIG. 26):



Manufacturer: AMX

Order number:

Medium type: <Any>

Product family: <Any>

Product name:

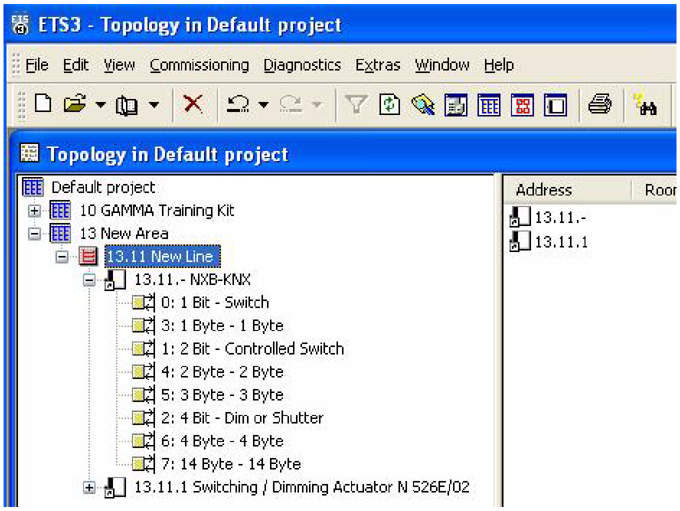
Product type:

1 into 13.11 New Line

Name	Description	Product
NXB-KNX	NXB-KNX virtual device	NXB-KNX

FIG. 26 Product Finder dialog

3. In the *Product Finder* dialog:
    a. Select **AMX** from the *Manufacturer* drop down.
    b. Click **Find**.
    c. The *NXB-KNX Virtual Device* will appear in the search results.
    d. Select **NXB-KNX** and click **Insert**.
    e. Close the *Product Finder* dialog.
4. The NXB-KNX Virtual Device is indicated in the appropriate line (FIG. 27):


ETS3 - Topology in Default project
File Edit View Commissioning Diagnostics Extras Window Help
Topology in Default project

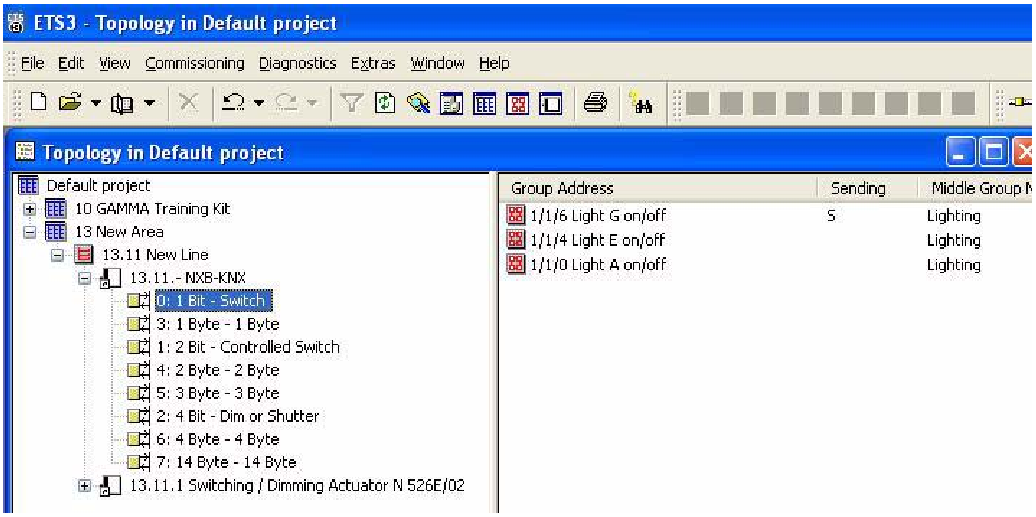
- Default project
    - 10 GAMMA Training Kit
    - 13 New Area
        - 13.11 New Line
            - 13.11.- NXB-KNX
                - 0: 1 Bit - Switch
                - 3: 1 Byte - 1 Byte
                - 1: 2 Bit - Controlled Switch
                - 4: 2 Byte - 2 Byte
                - 5: 3 Byte - 3 Byte
                - 2: 4 Bit - Dim or Shutter
                - 6: 4 Byte - 4 Byte
                - 7: 14 Byte - 14 Byte
            - 13.11.1 Switching / Dimming Actuator N 526E/02

Address	Roor
13.11.-	
13.11.1	

FIG. 27 ETS3 - Topology in Default Project indicating NXB-KNX

To facilitate cross-line and cross-area communication, all group addresses which do not originate from a device that is located on the immediate line must be linked with the appropriate communication object on the NXB-KNX Virtual Device.

For example, FIG. 28 indicates *Light G*, *Light E* and *Light A* (which are all of type 1 Bit) are linked with the NXB-KNX Virtual Device 1 Bit communication object.


ETS3 - Topology in Default project
File Edit View Commissioning Diagnostics Extras Window Help
Topology in Default project

- Default project
    - 10 GAMMA Training Kit
    - 13 New Area
        - 13.11 New Line
            - 13.11.- NXB-KNX
                - 0: 1 Bit - Switch
                - 3: 1 Byte - 1 Byte
                - 1: 2 Bit - Controlled Switch
                - 4: 2 Byte - 2 Byte
                - 5: 3 Byte - 3 Byte
                - 2: 4 Bit - Dim or Shutter
                - 6: 4 Byte - 4 Byte
                - 7: 14 Byte - 14 Byte
            - 13.11.1 Switching / Dimming Actuator N 526E/02

Group Address	Sending	Middle Group N
1/1/6 Light G on/off	S	Lighting
1/1/4 Light E on/off		Lighting
1/1/0 Light A on/off		Lighting

FIG. 28 ETS3 - Topology in Default Project indicating NXB-KNX

1. Create this linkage for all group addresses which do not originate within the line at which the NXB-KNX is physically attached.
2. Repeat this process starting with the *Adding the Virtual Device to the ETS3 Project* for all additional NXB-KNX's in your installation.

NetLinx Firmware Upgrades

Overview

The NetLinx Studio software application (available for free download from www.amx.com) provides the ability to transfer KIT firmware files to a NetLinx device such as the NXB-KNX.

To send firmware files, select **Tools > Firmware Transfers,** then select *Send to NetLinx Device* from the sub-menu.

Before You Start

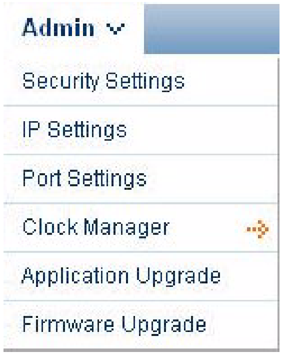
1. Establish the Firmware and device Application versions currently loaded on your NXB-KNX.

   In the Admin Menu, look for the following entries:

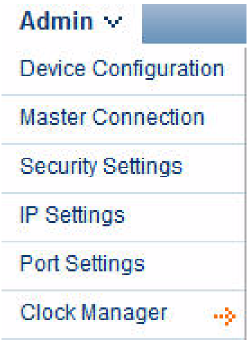
   - **Application Upgrade** - Accesses the *Application Upgrade Manager* page.
   - **Firmware Upgrade** - Accesses the *Firmware Upgrade Manager* page.

   The presence of these options in the Admin Menu indicates that your NXB-KNX unit is currently loaded with:

   - Firmware version **1.0.14** and
   - Application version **1.0.1**



Admin Menu as it appears on NXB-KNX units loaded with:
Firmware v1.0.14
Application v1.0.1
(requires upgrade to allow the unit to function as a native NetLinx device)



Admin Menu as it appears on NXB-KNX units loaded with current Netlinx firmware.

Refer to the *One-Time Upgrade of the NXB-KNX to a Native NetLinx Device* section on page 45 for instructions.

FIG. 29 Send To NetLinx Device dialog (NetLinx Studio)

NOTE *Alternatively, you can identify the current firmware version via telnet (see Establishing a Terminal Connection Via Telnet* section on page 49*) - the Welcome banner indicates the current firmware version.*

In this case, the NXB-KNX must be upgraded to the following Firmware and device Application versions (via .JAR files), in order to allow the NXB-KNX to function as a native NetLinx Device:

- Firmware version **1.0.36** (or higher)
- Application version **2.0.15** (or higher)

Refer to the *One-Time Upgrade of the NXB-KNX to a Native NetLinx Device* section on page 45 for directions on upgrading the Firmware and Application versions to these base minimum versions.

Once the unit has been upgraded, the NXB-KNX will function as a native NetLinx device, and all subsequent Firmware upgrades are handled via NetLinx Studio, using KIT files (like any other native NetLinx device).

2. Verify you have the latest version of NetLinx Studio on your PC. Use the **Web Update** option in NetLinx Studio's Help menu to obtain the latest version. Alternatively, go to www.amx.com and login as a Dealer to download the latest version.
3. Go to **www.amx.com** and download the latest Firmware file. Firmware files are available to download from www.amx.com - on the product's page in the online catalog.
4. Verify that an Ethernet cable is connected from the NetLinx Master to the Ethernet Hub.
5. Verify that the NetLinx Master is powered On.
6. Determine the Device Number assigned to the target NXB-KNX.
   - By default, the Device Number assigned to the NXB-KNX is **0** (zero).
   - The Device Number can be viewed/edited in the NXB-KNX Configuration Manager - Device Configuration Page (see the *Device Configuration* section on page 7 for details).
7. Launch NetLinx Studio and open the Online Device Tree.

Sending a Firmware (*.KIT) File To the NXB-KNX

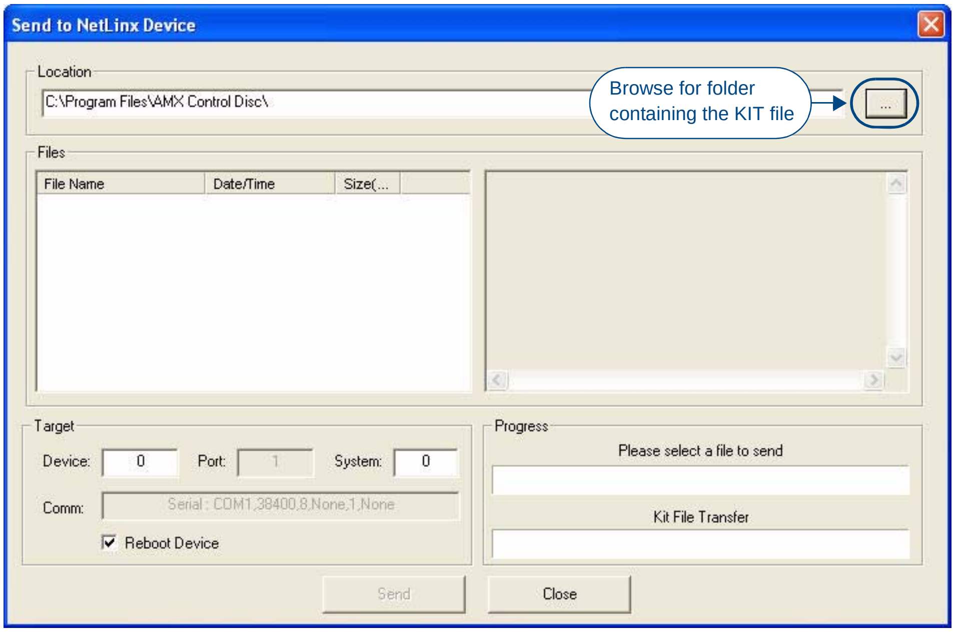
Use the *Firmware Transfers* options in the Tools menu to update the firmware in the NXB-KNX. NetLinx Devices such as the NXB-KNX use KIT files for firmware upgrades.

NOTE

A Kit file (.KIT) is a package of several files, all of which are required to upgrade the firmware, and are available online via www.amx.com. Firmware download links are provided in the relevant product page.*

- The Online Device Tree (Online Tree tab of the Workspace Window) displays information about each online device, including the current firmware version.
- Before attempting to upgrade the firmware, you must have the appropriate Kit file for your NXB-KNX.
- To help alleviate system or network latency issues during file transfer, place KIT files in a "local" drive for speedy throughput.

1. Choose **Tools** > **Firmware Transfers** > **Send to NetLinx Device** to open the *Send To NetLinx Device* dialog (FIG. 30).



Location: C:\Program Files\AMX Control Disc\

Device: 0 Port: 1 System: 0

Comm: Serial : COM1,38400,8,None,1,None

☑ Reboot Device

Please select a file to send

Kit File Transfer

FIG. 30 Send To NetLinx Device dialog (NetLinx Studio)

2. Click the **Browse (...)** button to navigate to the target directory in the *Browse For Folder* dialog (FIG. 31).

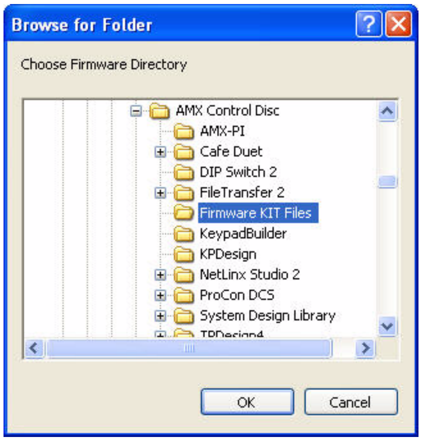
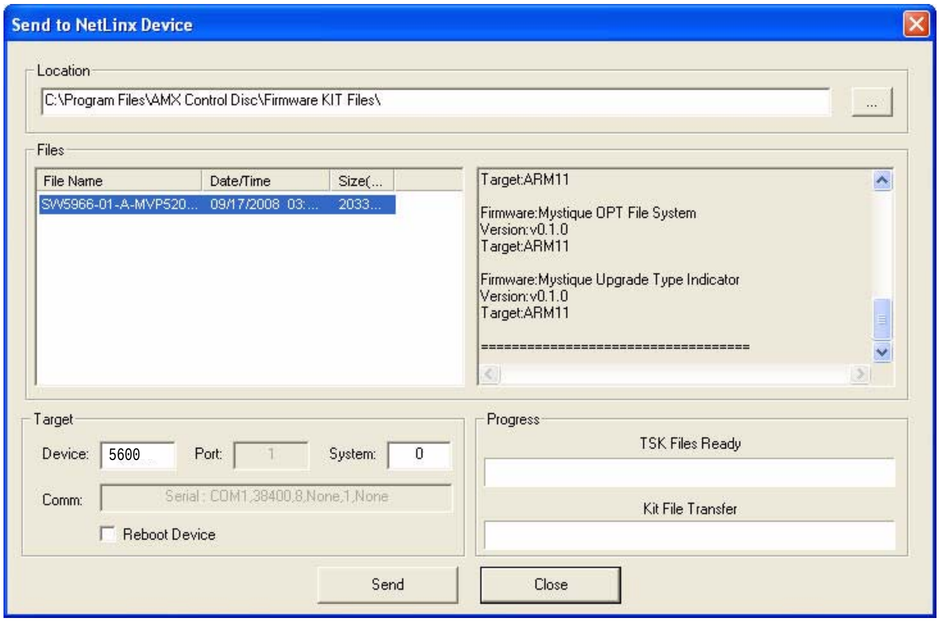


FIG. 31 Browse For Folder dialog (NetLinx Studio)

- The selected directory path is displayed in the *Send To NetLinx Device* dialog (*Location* text box).
- Assuming that the specified target directory contains one or more KIT files, the KIT files in the selected directory are displayed in the *Files* list box, with the file's last modified date and time (FIG. 32).



Location: C:\Program Files\AMX Control Disc\Firmware KIT Files\

File Name	Date/Time	Size(...
SW5966-01-A-MVP520...	09/17/2008 03:...	2033...

```
Target:ARM11

Firmware:Mystique OPT File System
Version:v0.1.0
Target:ARM11

Firmware:Mystique Upgrade Type Indicator
Version:v0.1.0
Target:ARM11

==================================
```

Device: 5600 Port: 1 System: 0

Comm: Serial : COM1,38400,8,None,1,None

☐ Reboot Device

FIG. 32 Send To NetLinx Device dialog (NetLinx Studio)

3. Select the appropriate *.KIT file from the *Files* list.
4. Enter the Device and System ID numbers for the NXB-KNX in the **Device** and **System** text boxes.
   - By default, the Device Number assigned to the NXB-KNX is **0**.
   - Use the Online Device Tree to determine the device's assigned ID, if it has been changed.
5. Review the File, Connection, Address, and Target Device information before you send.
6. Click the **Send** button. You can watch the progress of the transfer in the *Send to NetLinx Device* dialog.

   NetLinx Studio transfers the files to the NXB-KNX and then tells it to reboot. After it reboots, the NXB-KNX actually goes through the upgrade process.
   - During the upgrade process, the Status LED blinks, and the NXB-KNX stays offline.
   - Once the upgrade is complete, the LED will stop blinking and the NXB-KNX will come online.

WARNING

If for any reason your Kit file transfer should fail, continue to retry the transfer until you are successful. DO NOT reboot the NXB-KNX, or change connections until the transfer is complete. Failure to complete this operation successfully may require a factory repair of the NXB-KNX.

Additional Documentation

For additional information on using NetLinx Studio, refer to the NetLinx Studio online help and Operation/Reference Guide (available at www.amx.com).

One-Time Upgrade of the NXB-KNX to a Native NetLinx Device

Overview

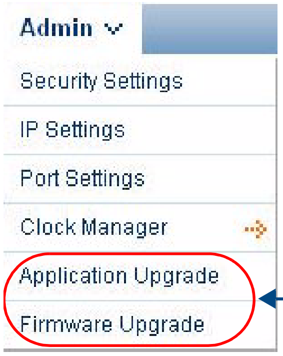
This section describes the process of upgrading an older NXB-KNX to the latest version of NetLinx Firmware.

The initial release of the NXB-KNX operated as an IP Device (as opposed to a native NetLinx device). As an IP device, the process of upgrading the unit to the latest firmware involves upgrading both the device Application and the Firmware, via options in the *Firmware Upgrade Manager* (see FIG. 34 on page 46) and the *Application Upgrade Manager* pages (see FIG. 35 on page 47).

Subsequent releases (and the current version) of the NXB-KNX operate as a native NetLinx device. As a NetLinx device, the process of upgrading the unit is the same as for any typical NetLinx device: the latest NetLinx firmware KIT file is downloaded from www.amx.com, and transferred to the NXB-KNX via the NetLinx Master, using NetLinx Studio. See the *NetLinx Firmware Upgrades* section on page 41 for details.

Older NXB-KNX units that are still using the initial Application and Firmware versions can be upgraded to allow them to function as a native NetLinx device.

Older NXB-KNX units that are using the initial Application and Firmware versions feature two Configuration pages that are not included in the current version: the **Application Upgrade Manager** page and the **Firmware Upgrade Manager** page (FIG. 33).



These two options only appear on early versions of the NXB-KNX firmware

FIG. 33 Admin menu - early Firmware versions only

If these options do not appear in the Admin Menu, then your NXB-KNX unit is already a NetLinx device, and the directions in this section does not apply.

NOTE

Alternatively, you can identify the current firmware version via telnet (see Establishing a Terminal Connection Via Telnet section on page 49*) - the Welcome banner indicates the current firmware version.*

There are two aspects of the NXB-KNX that can be upgraded: the device Firmware and device Application, both of which are normally updated via options in the *Firmware Upgrade Manager* (see FIG. 34 on page 46) and *Application Upgrade Manager* pages (see FIG. 35 on page 47). However, special steps are required to perform an initial upgrade from early versions of the NXB-KNX Application and Firmware.

The following steps describe upgrading the NXB-KNX from:

Firmware ***v1.0.14*** and *Application* ***v1.0.1***

to

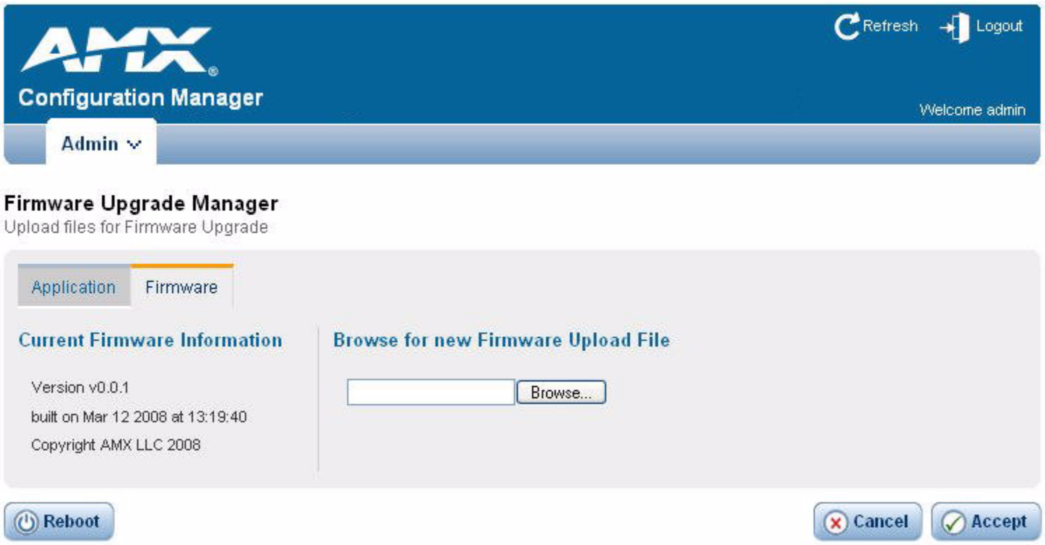
Firmware ***v1.0.36*** and *Application* ***v2.0.15***

NOTE

The Firmware upgrade must be performed ***before*** *the Application upgrade.*

Determining the Current Firmware Version Of the NXB-KNX

Select **Firmware Upgrade** from the Admin menu to open the *Firmware Upgrade Manager* page (FIG. 34). Use the options on the page to upgrade the firmware on this NXB-KNX unit.



Version v0.0.1
built on Mar 12 2008 at 13:19:40
Copyright AMX LLC 2008

FIG. 34 Firmware Upgrade Manager page

This page allows you view information on the firmware version currently loaded on this unit, and to upload a firmware .JAR file to the unit.

NOTE

Another method of determining the current firmware version is to establish a telnet session to the NXB-KNX. See Establishing a Terminal Connection Via Telnet section on page 49.*The Welcome banner in item 4 indicates the current firmware version.*

Browse For the New Firmware Upload File

Select the Browse button to open a standard file display for traversing your PC's file structure, and selecting an individual .JAR file.

The selected file name is displayed in the associated text box.

Click the *Accept* button to initiate the download of the selected .JAR file to the unit.

- If the download fails for any reason, an error message is displayed indicating the failure.
- If the download is successful, a message is displayed.

Click the **Reboot** button to initiate a system reboot. Firmware changes only take effect after a reboot.

NOTE

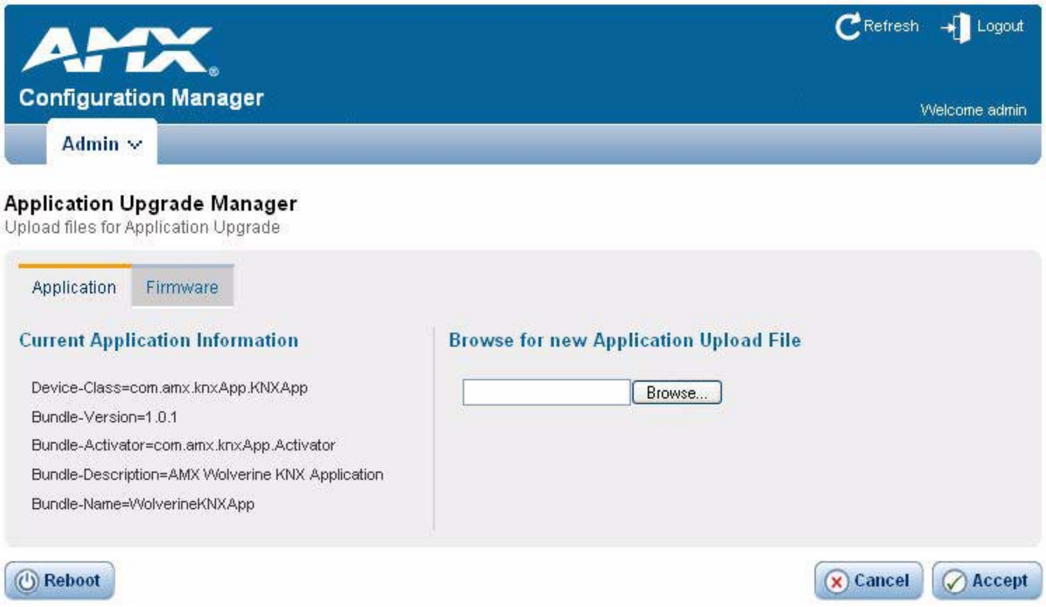
System information will not be updated until after a system reboot.

If Current Firmware Version Is Lower Than v1.0.36

1. Select **Firmware Upgrade** from the Admin drop-down menu to open the *Firmware Upgrade Manager* page (FIG. 34 on page 46).
2. Click **Browse**, and select the file: **XXXX1.0.36.jar**.
3. Click **Accept**.
4. When the upgrade is complete, reboot the NXB-KNX.

Determining the Current Application Version Of the NXB-KNX

Information on the current application version loaded on the device is displayed in the *Application Upgrade Manager* page (FIG. 35).


AMX
Configuration Manager
Refresh
Logout
Welcome admin
Admin
Application Upgrade Manager
Upload files for Application Upgrade
Application
Firmware
Current Application Information
Browse for new Application Upload File
Browse...
Reboot
Cancel
Accept

Device-Class=com.amx.knxApp.KNXApp
Bundle-Version=1.0.1
Bundle-Activator=com.amx.knxApp.Activator
Bundle-Description=AMX Wolverine KNX Application
Bundle-Name=WolverineKNXApp

FIG. 35 Application Upgrade Manager page

If Current Application Version Is Lower Than v2.0.15

1. Select **Application Upgrade** from the Admin drop-down menu to open the *Application Upgrade* page (FIG. 35 on page 47).
2. Click **Browse**, and select the file **XXXX2.0.15.jar**.
3. Click **Accept**.
4. When the upgrade is complete, reboot the NXB-KNX.

NOTE

Once the Application upgrade is performed, all subsequent upgrades will be performed via Netlinx Studio supported Kit file upgrades. See the NetLinx Firmware Upgrades section on page 41 *for details.*

Appendix A: Telnet Commands

Overview

The NXB-KNX supports Telnet communications. This type of terminal communication can be accessed remotely, via TCP/IP.

Telnet is an insecure form of terminal communication, since it does not require a physical connection to the device to connect. Further, the Telnet interface exposes information to the network (which could be intercepted by an unauthorized network client).

It is recommended that you make initial configurations as well as subsequent changes via the Web Console. Refer to the Configuration section on page 5*.*

Refer to the *Terminal Commands* section on page 50 for a listing of all commands available in a terminal session.

Establishing a Terminal Connection Via Telnet

1. In your Windows taskbar, go to **Start** > **Run** to open the Run dialog.
2. Type **cmd** in the *Open* field and click **OK** to open an instance of the Windows command interpreter (Cmd.exe).
3. In the CMD (command), type "**telnet**" followed by a space and the NXB-KNX's IP Address info.

   Example: `>telnet XXX.XXX.XXX.XXX`
4. Press *Enter.*
   - Unless Telnet security is enabled, a session will begin with a welcome banner:

```
Welcome to AMX v1.0.36 Copyright AMX LLC 2008
>
```

   - If Telnet security is enabled, type in the word **login** to be prompted for a Username and Password before gaining access to the NXB-KNX.

5. Enter your username to be prompted for a password.
   - If the password is correct you will see the welcome banner.
   - If the password is incorrect, the following will be displayed:

```
Login: User1
Password: *****
Login not authorized. Please try again.
```

After a delay, another login prompt will be displayed to allow you to try again.

If after 5 prompts, the login information is not entered correctly, the following message will be displayed and the connection closed:

```
Login not allowed. Goodbye!
```

If a connection is opened, but a valid a username / password combination is not entered (i.e. just sitting at a login prompt), the connection will be closed after one minute.

Terminal Commands

The Terminal commands listed in the following table can be sent directly to the NXB-KNX via Telnet terminal session.

In your terminal program, type "**Help**" or a question mark ("**?**") and **<Enter>** to access the Help Menu, and display the Program port commands described below:

Terminal Commands	
Command	Description
`----- Help -----`	(Extended diag messages are OFF)
`? or Help`	Displays this list of commands.

`DATE`	Displays the current date and day of the week.
	Example:
	`>DATE`
	`10/31/2004 Wed`

`DISK FREE`	Displays the total bytes of free space available.
	Example:
	`>DISK FREE`
	`The disk has 2441216 bytes of free space.`

`DNS LIST <D:P:S>`	Displays the DNS configuration of a specific device including:
	• Domain suffix·
	• Configured DNS IP Information
	Example:
	`>DNS LIST [0:1:0]`
	`Domain suffix:amx.com`
	`The following DNS IPs are configured`
	`Entry 1-192.168.20.5`
	`Entry 2-12.18.110.8`
	`Entry 3-12.18.110.7`

`ECHO ON|OFF`	Enables/Disables echo (display) of typed characters.
`GET JAVA HEAP`	Display the amount of memory allocated for Java pool. This is the current Java memory heap size as measured in Megabytes. Example: a value of 5M = 5 MB.

`GET ETHERNET MODE`	Displays the current ethernet configuration setting.
	Settings are either "auto" in which the ethernet driver will discover it's settings based on the network it is connected to OR <speed> and <duplex> where speed is either 10 or 100 and duplex is either full or half.
	Example:
	`>GET ETHERNET MODE`
	`Ethernet mode is auto.`
	Note: See SET ETHERNET MODE.

`GET IP`	Displays the current IP configuration.
	Example:
	`>GET IP`
	`IP Settings`
	`HostName    MLK_INSTRUCTOR`
	`Type        DHCP`
	`IP Address  192.168.21.101`
	`Subnet Mask 255.255.255.0`
	`Gateway IP  192.168.21.2`
	`MAC Address 00:60:9f:90:0d:39`

`IPSEC ON|OFF|STATUS`	Enables/Disables IPSec security or displays current setting.

`MEM`	Displays the largest free block of the NXB-KNX's memory.
	Example:
	`>MEM`
	`The largest free block of memory is 11442776 bytes.`

Terminal Commands (Cont.)	
Command	Description

`MSG ON|OFF`	Enables/Disables extended diagnostic messages.
	• MSG On sets the terminal program to display all messages generated by the NXB-KNX.
	• MSG OFF disables the display.
	Example:
	`> MSG ON`
	`  Extended diagnostic information messages turned on.`
	`> MSG OFF`
	`  Extended diagnostic information messages turned off.`

`PING [ADDRESS]`	Pings an address (IP or URL), to test network connectivity to and confirms the presence of another networked device. The syntax is just like the PING application in Windows or Linux.
	Example:
	`>ping 192.168.29.209`
	` 192.168.29.209 is alive.`

`PWD`	Displays the name of the current directory. Example: pwd `      The current directory is doc:`

`REBOOT`	Reboots the NXB-KNX.
	Example:
	`>REBOOT`
	` Rebooting...`

`RELEASE DHCP`	Releases the current DHCP lease for the NXB-KNX. ***Note****: The NXB-KNX must be rebooted to acquire a new DHCP lease.* Example: `>RELEASE DHCP`
`SECURITY SETUP`	Modify system security settings.

`SET DATE`	Prompts you to enter the new date for the NXB-KNX.
	Example:
	`>SET DATE`
	` Enter Date: (mm/dd//yyyy) ->`
	Note*: Due to the absence of a battery-backed real-time clock, setting the current date is only valid for the life of the current run. When the unit is rebooted, the date will be lost.*

`SET DNS`	Sets up the DNS configuration. This command prompts you to enter a Domain Name, DNS IP #1, DNS IP #2, and DNS IP #3. Then, enter Y (yes) to approve/store the information in the NXB-KNX.
	Entering N (no) cancels the operation.
	Note*: The device must be rebooted to enable new settings.*
	Example:
	`>SET DNS`
	`-- Enter New Values or just hit Enter to keep current settings --`
	
	`  Enter Domain Suffix: amx.com`
	`  Enter DNS Entry 1  : 192.168.20.5`
	`  Enter DNS Entry 2  : 12.18.110.8`
	`  Enter DNS Entry 3  : 12.18.110.7`
	
	`  You have entered: Domain Name: amx.com`
	`                    DNS Entry 1: 192.168.20.5`
	`                    DNS Entry 2: 12.18.110.8`
	`                    DNS Entry 3: 12.18.110.7`
	
	`  Is this correct? Type Y or N and Enter -> Y`
	`  Settings written. Device must be rebooted to enable new settings`

Terminal Commands (Cont.)

Command	Description
`SET JAVA HEAP`	Set the amount of memory allocated for the Java pool. This is the current Java memory heap size as measured in Megabytes. • Valid values = 5M - 35M • Recommended default = 32M ***Note****: This setting does not take effect until the next reboot.*

`SET ETHERNET MODE <CMD>`	This command sets the current Ethernet configuration settings - auto OR speed = 10 | 100, duplex = full | half.
	Example:
	`set ethernet mode auto`
	`      set ethernet mode speed=100 duplex=full`
	Note*: See GET ETHERNET MODE.*

`SET FTP PORT`	Enables/Disables the NXB-KNX's IP port listened to for FTP connections.
	Note*: The device must be rebooted to enable new settings.*
	Example:
	`>SET FTP PORT`
	` FTP is enabled`
	` Do you want to enable (e) or disable (d) FTP (enter e or d):`
	` FTP enabled, reboot the NXB-KNX for the change to take affect.`

`SET HTTP PORT`	Sets the NXB-KNX's IP port listened to for HTTP connections.
	Note*: The device must be rebooted to enable new settings.*
	Example:
	`>SET HTTP PORT`
	` Current HTTP port number = 80`
	` Enter new HTTP port number (Usually 80) (0=disable HTTP):`
	` Setting HTTP port number to`
	` New HTTP port number set, reboot the NXB-KNX for the change to take`
	`affect.`

`SET HTTPS PORT`	Sets the NXB-KNX's IP port listened to for HTTPS connections.
	Note*: The device must be rebooted to enable new settings.*
	Example:
	`>SET HTTPS PORT`
	` Current HTTPS port number = 443`
	` Enter new HTTPS port number (Usually 443) (0=disable HTTPS):`
	Once you enter a value and press the ENTER key, you get the following message:
	` Setting HTTPS port number to`
	` New HTTPS port number set, reboot the NXB-KNX for the change to take`
	`affect.`

Terminal Commands (Cont.)	
Command	Description

`SET IP`	Sets the IP configuration. Enter a Host Name, Type (DHCP or Fixed), IP Address, Subnet Mask, and Gateway IP Address.
	***Note**: For NetLinx Central Controllers, the "Host Name" can only consist of alphanumeric characters.*
	• Enter Y (yes) to approve/store the information into the NXB-KNX.
	• Enter N (no) to cancel the operation.
	***Note**: The device must be rebooted to enable new settings.*
	Example:
	`>SET IP`
	` --- Enter New Values or just hit Enter to keep current settings ---`
	
	` Enter Host Name:    MLK_INSTRUCTOR`
	` Enter IP type. Type D for DHCP or S for Static IP and then Enter:`
	`DHCP`
	` Enter Gateway IP:   192.168.21.2`
	
	` You have entered: Host Name   MLK_INSTRUCTOR`
	`                   Type        DHCP`
	`                   Gateway IP  192.168.21.2`
	` Is this correct? Type Y or N and Enter -> y`
	` Settings written. Device must be rebooted to enable new settings.`

`SET LOG COUNT`	Sets the number of entries allowed in the message log.
	***Note**: The device must be rebooted to enable new settings.*
	Example:
	`>SET LOG COUNT`
	`  Current log count = 1000`
	`  Enter new log count (between 50-10000):`
	Once you enter a value and press the ENTER key, you get the following message:
	`  Setting log count to`
	`  New log count set, reboot the NXB-KNX for the change to take affect.`

`SET SSH PORT`	Sets the NXB-KNX's IP port listened to for SSH connections.
	***Note**: The device must be rebooted to enable new settings.*
	Example:
	`>SET SSH PORT`
	`  Current SSH port number = 22`
	`  Enter new SSH port number (Usually 22) (0=disable SSH):`
	Once you enter a value and press the ENTER key, you get the following message:
	`  Setting SSH port number to 22`
	`  New SSH port number set, reboot the NXB-KNX for the change to take`
	`affect.`

`SET TELNET PORT`	Sets the NXB-KNX's IP port listened to for Telnet connections.
	***Note**: The NXB-KNX must be rebooted to enable new settings.*
	Example:
	`>SET TELNET PORT`
	` Current telnet port number = 23`
	` Enter new telnet port number (Usually 23)(0=disable Telnet):`
	Once you enter a value and press the ENTER key, you get the following message:
	`  Setting telnet port number to 23`
	`  New telnet port number set, reboot the NXB-KNX for the change to`
	`take affect.`

<table>
<tr><th colspan="2">Terminal Commands (Cont.)</th></tr>
<tr><th>Command</th><th>Description</th></tr>
<tr><td><code>SET TIME</code></td><td>

Sets the current time.

Example:

```
>SET TIME
 Enter Date: (hh:mm:ss) ->
```

***Note**: Due to the absence of a battery-backed real-time clock, setting the current time is only valid for the life of the current run. When the unit is rebooted, the time will be lost.*

</td></tr>
<tr><td><code>SHOW LOG</code></td><td>

Displays the log of messages stored in the NXB-KNX's memory.

The NXB-KNX logs all internal messages and keeps the most recent messages.

The log contains:·

- Entries starting with first specified or most recent
- Date, Day, and Time message was logged
- Which object originated the message
- The text of the message:

```
SHOW LOG [start] [end]
SHOW LOG ALL
```

- <start> specifies message to begin the display.
- If start is not entered, the most recent message will be first.
- If end is not entered, the last 20 messages will be shown.
- If <ALL> is entered, all stored messages will be shown, starting with the most recent.

Example:

```
>SHOW LOG
 Message Log for System 50 Version: v2.10.75
 Entry        Date/Time       Object
      Text
 -----------------------------------------------------------------
  1: 11-01-2001 THU 14:14:49 ConnectionManager
     Memory Available = 11436804 <26572>
  2: 11-01-2001 THU 14:12:14 ConnectionManager
     Memory Available = 11463376 <65544>
  3: 11-01-2001 THU 14:10:21 ConnectionManager
     Memory Available = 11528920 <11512>
  4: 11-01-2001 THU 14:10:21 TelnetSvr
 Accepted Telnet connection:socket=14 addr=192.168.16.110 port=2979
  5: 11-01-2001 THU 14:05:51 Interpreter
     CIpEvent::OnLine 10002:1:50
  6: 11-01-2001 THU 14:05:51 Interpreter
     CIpEvent::OnLine 128:1:50
  7: 11-01-2001 THU 14:05:51 Interpreter
     CIpEvent::OffLine 128:1:50
  8: 11-01-2001 THU 14:05:51 Interpreter
     CIpEvent::OnLine 96:1:50
  9: 11-01-2001 THU 14:05:51 Interpreter
     CIpEvent::OffLine 96:1:50
 10: 11-01-2001 THU 14:05:51 Interpreter
     CIpEvent::OnLine 128:1:50
 11: 11-01-2001 THU 14:05:51 Interpreter
     CIpEvent::OnLine 96:1:50
 12: 11-01-2001 THU 14:05:51 Interpreter
     CIpEvent::OnLine 5001:16:50
 13: 11-01-2001 THU 14:05:51 Interpreter
     CIpEvent::OnLine 5001:15:50
 14: 11-01-2001 THU 14:05:51 Interpreter
```

</td></tr>
<tr><td><code>SHOW HEAP</code></td><td>Displays heap usage statistics.</td></tr>
<tr><td><code>SHOW MEM</code></td><td>Displays the memory usage for all memory types.</td></tr>
<tr><td><code>TIME</code></td><td>

Displays the current time on the NXB-KNX.

Example:

```
>TIME
 13:42:04
```

</td></tr>
</table>

Appendix B: Troubleshooting

Overview

AMX recommends activating debugging mode during diagnostics to display additional error messages. This is activated with monitor command "DEBUGON".

The following table provides tips for error definition, in case it does not work. This serves a quick error analysis ON SITE.

Troubleshooting	
Error	Proposed solution / error definition
No controls possible, no feedback	Ensure NXB-KNX is detected in Netlinx Studio online tree.
No controls possible, no feedback, according to "Status" the NXB-KNX is detected	Enter command "List" in debug mode. • Are all addresses entered? • Are feedback values displayed? Try to switch several addresses directly with "SET" (e.g. light). If it works, there is probably an error in the AMX program. If also no access is possible (Is the light still on?), the reason is probably wrong group addresses.
NXB-KNX does not appear in the NetLinx Studio OnLine Tree view	Confirm the NXB-KNX is powered on and connected to your network using an approved PoE cable. Use a zero-config client, like Internet Explorer's Bonjour or NetLinx Studio's Zero-Config tab, to access the NXB-KNX Configuration Manager. • Check the NXB-KNX IP Settings match your network configuration. • Check the NXB-KNX Master Connection settings match your AMX Master controller configuration. Confirm the current NXB-KNX connection status by viewing the NXB-KNX status banner. • Obtain the NXB-KNX ip address using a zero-config client. • Establish a telnet session with the NXB-KNX. • Enable display of diagnostic messages by typing 'msg on all'. • The NXB-KNX status banner will refresh every 15 minutes. • Or, use the 'show log' command to display the message log.
NXB-KNX date/time is incorrect	Use the NXB-KNX Configuration Manager Clock Manager to configure the NXB-KNX time/date settings. • It is recommended that the NXB-KNX time/date settings match its AMX Master controller time/date settings. • e.g. The NXB-KNX and the AMX Master controller both use the same NIST server.
NXB-KNX appears in the NetLinx Studio OnLine Tree view, but no control or feedback is possible	Confirm the NXB-KNX device number shown in the NetLinx Studio OnLine Tree view matches your NetLinx project's NXB-KNX device number definition. Use the NXB-KNX Configuration Manager Device Configuration to change the NXB-KNX device number.

Troubleshooting

Error	Proposed solution / error definition
Responses to interactive commands, e.g. 'list', are not displayed.	Responses to interactive commands are displayed only when the NXB-KNX log level is debug. Confirm the NXB-KNX log level is debug. • Establish a telnet session with the NXB-KNX. • Enable display of diagnostic messages by typing 'msg on all'. • The NXB-KNX status banner will refresh every 15 minutes. • Or, use the NXB-KNX 'status' command to force the status banner to display. • Or, use the 'show log' command to display the message log. Use the NXB-KNX 'debugon' command to set the log level to debug. • It is recommended to return the NXB-KNX to its operational log level of info when the interactive session is completed. • Use the NXB-KNX 'debugoff' command to return the log level to info.
Control and/or feedback is not working	Confirm the NXB-KNX configuration by using the 'list' interactive command. • Do all expected actors appear in the list? • Do all expected group addresses appear in the list? • Is the group address assigned to the expected actor number? Remember, the actor number is also the channel and level number. • Are all group addresses configured using the correct data type e.g. 'Switch'? Confirm the KNX device configuration parameters by using the ETS program. Confirm the KNX device is connected to the KNX bus. Confirm the NXB-KNX is connected to the KNX bus.

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